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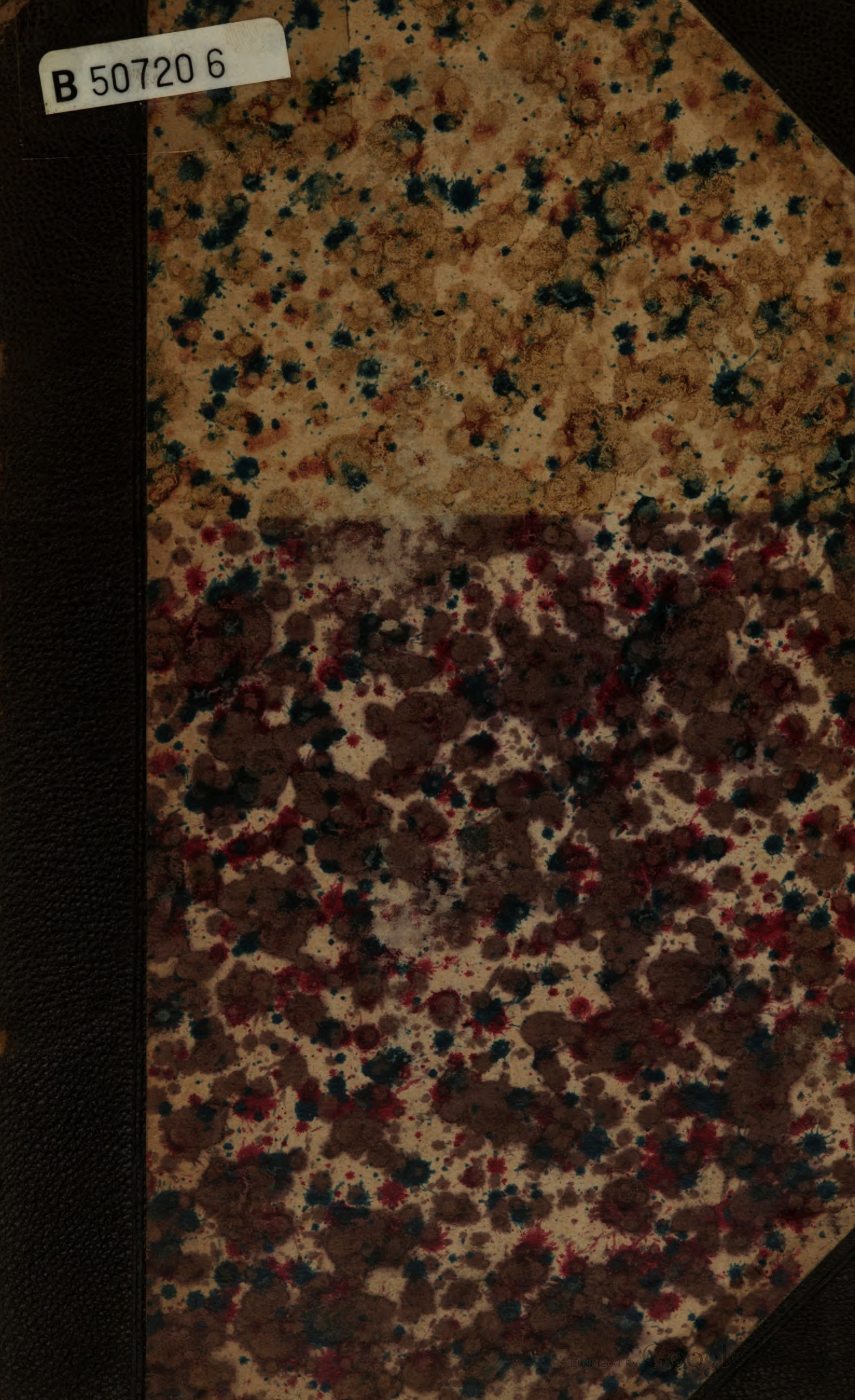

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NOTE ON ACONITE ROOT.

BY EDWARD R. SQUIBB, M.D.

There is good reason to believe that the appreciation of the value of preparations of aconite root in therapeutics, and the increasing use of these medicines are hindered by the want of uniformity in quality of the root as met with in the markets, and the custom of pharmacists generally of buying by appearance, or what is still worse, buying in powder. The writer has been for some years past almost constantly in search of this drug of proper quality for medicinal use: and has been frequently out of it and its preparations through inability to find it in the markets of the seaport cities of this country, and has even failed to get it in London. Yet, if quality be not considered, or not tested, there are few drugs more easily or more cheaply attainable at all times. From the large brown root, which rarely is, though often is called "English," to the small black root commonly known as "German," the markets are always abundantly supplied with root of various sizes and shades of color. The general appearance is almost always good, and the root clean and sound, and even on fracture, the substance of the root appears to be of fair quality. Upon testing, however, it will often be found that not more than four or five roots in ten have any medicinal activity, and these only in feeble degree. Occasionally parcels will be met with in which every root possesses the desired activity, at least in some notable degree. Thus it becomes necessary to decide upon some arbitrary standard of strength to govern the selection, and in the present state of the markets this must not be set too high, if anything like a uniform supply of fresh preparations is to be kept up. The arbitrary rule adopted by the writer many years ago, was not to buy any parcel from which six roots out of ten did not yield a fair degree of medicinal activity, and to get as much above this as possible. Within the past two years the quality in this market has somewhat improved, and now the arbitrary rule has been changed, and eight roots out of ten from an ordinary handful sample is the standard. If pharmacists generally would apply some such rule we would soon have a market supplied with a much better and more uniform quality, and it is the first object of this note to urge pharmacists to a more careful discrimination, since upon this all uniformity and efficiency in medicinal use of the drug must be based. The root should never be bought in powder, because in the present state of pharmacy quantitative testing would not be applied, and because a proportion of even three or four good roots in ten gives to the powder an apparent activity which is deceptive when judged by qualitative testing.

The causes of this general bad quality of aconite root are, so far as this writer is concerned, unknown; yet two or three prominent causes may be reasonably inferred, and perhaps should be mentioned, in order that the reader may judge of their value.

One of the most probable causes of this condition of the market is that terrible screw of price from which it seems almost impossible to escape. The present ruling prices of aconite root by the bale in this market varies between fourteen and twenty cents per pound, according to the appearance. Now when it is remembered that this includes two or three profits or commissions, the freight and charges inseparable from a three thousand miles transit, to say nothing of the time, capital, and risk involved, it will be seen that the price realized by those who collect and dry the drug for the market, must be very small indeed, and totally insufficient to pay for the requisite knowledge, care, and skill, since two pounds or more of fresh root are required to yield one pound of dry. Hence in order to be sold at so low a price, it may be, and probably is, collected by ignorant women and children, who take it at any season of the year in which they can find it; leave as much of the stalk on the root as they can; dry it in the easiest and most rapid way possible, and then hurry it into the market. Occasionally parcels will be found within this range of prices, which are of good quality, but for anything like uniformity in good quality the common drug market and its prices must be abandoned for special importations to order, at two or three times the common price, and under strict conditions as to quality.

From all this it would follow that if buyers would look carefully to quality so as to recognize it when they get it, and then be willing to pay for it in proportion to its intrinsic value, the markets would respond to their knowledge and true interests in the character of supplies. It is the aggregate buyer who makes the aggregate market, and if so, the pharmacist has but himself to blame for the condition of his market. No reasonable probability should escape his thoughtful consideration, and his knowledge and skill should keep pace with the artistic refinements in cunning and deception.

Many parcels of aconite root seen within the past few years by their partial or entire tastelessness, lead directly to the suspicion that they have been partially or entirely exhausted, and afterward dried and put into the market. There is no doubting the identity of the root, and yet there is no season of the year, age of the plant, nor probable mode of drying, which would yield it totally insipid and devoid of activity, as more than half the roots of some parcels prove to be.

It is now generally believed that the growth of microscopic plants and animals destroys the active principles of many substances, and the published results with solutions of salts of atropia seem to establish the fact for belladonna. If this be true of aconite, then mouldiness would be a cause of inertness, as it is frequently seen mouldy on arriving here, though the appearance of mould soon disappears under the skilful hands of an energetic salesman.

Aconite is a prominent illustration of the general practical fact, that when the drug can be had of good uniform quality, and the preparations from it are made with care and skill, the alkaloid from it is not only a useless, but a dangerous refinement, and becomes, through variation of species or variation of process of manufacture, as deficient in uniformity as the root itself is in commerce.

Aconite leaf and its preparations are comparatively feeble, and the natural and accidental causes of want of uniformity of strength are more numerous, and less susceptible of useful control. The leaf might, therefore, with advantage, be omitted from the Materia Medica.

It now only remains to be shown that there is a simple, practical, easy, and effectual way of testing aconite root by tasting it.

If a root be broken across, near the middle, and a piece the size of half a pin's head be bitten off from the edge of one of the fragments at the place of fracture; and if this piece be chewed between the front incisor teeth, in contact with the tip of the tongue, until it is converted into a pasty or liquid mass, and be then discharged from the mouth, and the parts with which it has been in contact be cleansed as thoroughly as possible by the natural flow of saliva which is produced, the testing process for the particular root in question is finished. If the root be inert, the fragment is nearly or quite tasteless, and no impression remains upon the tongue or lips after the parts are cleansed by the saliva. But if the root be a thoroughly good one, the taste is at once moderately bitter, the bitterness being in a great degree proportionate to the activity of the root.

The bitterness is, however, to a great extent lost when the mouth is cleansed, and there is then an interval of a minute or more of tastelessness. Soon, however, the peculiar and perfectly characteristic aconite impression comes gradually on, beginning with a sense of tingling, which soon becomes a pricking sensation, which passes into a local numbness, which once felt cannot be mistaken. This is not taste, but rather a paralysis of all sensation in the parts, and it is quite persistent, continuing from one to three hours, in proportion to the strength of the root and the quantity taken for the trial. It is not painful nor even annoying, nor is it hurtful when properly managed, but in using the test the virulently poisonous character of the drug should never be forgotten.

Both the taste and the aconite impression or effect will vary in intensity or degree in various roots, but no parcel of the root should be accepted, or be considered as officinal, in which more than two or three roots in ten fail to give the aconite impression or numbness.

If a tasted root fails to give the impression within ten or fifteen minutes, its parts should be laid off by themselves upon the sample paper, and another root may be at once taken. But if the aconite impression be obtained, this must be allowed to disappear entirely before another root is tasted, and the fragments of the good root must be laid together on another part of the sample paper. Thus in testing a good sample of the root, not more than three or four pieces can be tried in any one day, and about three days will be required to determine the quality of a sample of good root. But the testing, of course, is not incompatible with the ordinary duties of the pharmacist, and therefore involves no loss of time. In practice the time mentioned as requisite to test a given sample is almost always exceeded, because in the routine of a busy day the subject is often forgotten for a time, so that but one or two pieces are tried in a day.—*Proceedings of the Am. Pharmaceutieal Association*, 1872.

SIMPLE METHOD OF WATER ANALYSIS.

Every medical practitioner is familiar with the terrible risks attendant upon the use of bad water, and is anxious to employ the power and influence which he possesses in exposing those risks and in striving to avert them. But he is restrained by practical difficulties which are, in too many cases, insuperable. Local authorities are inert and often ignorant. The stupidity of the tenant is only equalled by the cupidity of the landlord. Water analysis costs money; and anyone who suggests its necessity is sure to be met instantly with the question, Who is to pay for it? Unfortunately, a proper analysis of water for sewage or drainage contamination is a process which from its complexity can only be carried out by a professional chemist; and in every important case such an analysis is a matter of necessity. But it is nevertheless true that it is perfectly possible to form a useful, and, in many cases, a sufficient estimate of the quality of water, and even approximately of the extent of its contamination, by the use of well known methods so simple as to be available to every intelligent man, and certainly to every medical practitioner. The methods we are about to describe must, of course, be applied as accurately as possible, and the results interpreted with caution; but we have verified them all with care and know that they may be depended on to the extent we indicate. For the sake of convenience, we have arranged them all for use with the weights and measures found in every surgery and chemist's shop.

1. *Examination of the source.*—This is of vital importance, and will often supersede the necessity of any analysis by indicating that the water *must* be foul. The chief sources are three—namely, rivers, surface-well or spring, and deep wells or deep seated springs. Wells 100 feet in depth may be reckoned in the last class. The contamination of rivers may be judged of by circumstances which will occur to all: the nature of the house-and-land drainage they receive, the proximity of factories, &c. Few rivers are above suspicion, and many are utterly

abominable as sources of supply. It is somewhat more difficult in many cases to judge of the contamination which a shallow well, often not more than 15 feet receives. Regard must of course be had to the proximity of drains, cesspools, stables, and the like; and much may often be gathered from a study of the nature and conformation of the land. Loose porous soil—such as gravel or broken chalk—is not only more liable to drainage contamination, but affords a more imperfect filtration than closer soil. Very shallow porous soils are often exceedingly foul from the stagnation and accumulation in them of manurial matters. The dip of the land is also an important element in the study. A cesspool below a well on a hillside may not pollute the water; but if above, the water will be almost sure to suffer.

The quality of the water of deep wells is still more difficult to determine by mere observation. If no surface-drainage can find its way in—a condition not always secured—we have to consider the filtering efficiency of the bed of earth through which the water has to pass in its downward passage. The "previous sewage contamination"—the record of past fouling—in such waters is often high, but it by no means follows that the water may not be free, or nearly free, from unoxidized organic matter.

2. *General characters.*—The amount of suspended matter in the water should be observed carefully. When it has subsided a portion may be examined under the microscope. Low forms of animal and vegetable life will often be seen, and this indication has some value, though not very much. In very bad water fragments of undigested muscular fibre can sometimes be seen. If a portion of this sediment be dried and burnt in a small porcelain basin over a spirit-lamp, it will exhale an unpleasant smell, if of animal nature. The *color* of the water is best seen by looking down a tall jar or glass tube. It should be greenish-blue; but clay, peat, and other harmless contaminations, cause a yellow or brownish tint; and on the other hand, bad water has sometimes a tolerably good color. The *smell* is often sufficient to identify very bad water. Shake a sample in a bottle and warm it occasionally; a fæcal or putrescent smell will often become apparent under these circumstances, though sometimes not until the bottle has stood for a day or two. It is a good plan to evaporate a portion of the water to dryness in a basin and then heat it over a spirit-lamp. Any organic matter will blacken under these circumstances, but animal matters, if in any quantity will also give a bad smell.

Unfortunately, we cannot give any easy and exact process for the determination of this nitrogen. But a useful though somewhat rough indication may be obtained as follows:—Concentrate a portion of the water (say two fluid ounces) to one-eighth of its bulk, avoiding boiling. Let it cool, and pour it into a test tube of about one-third of an inch diameter as much as fills nearly an inch of it. Add an equal bulk of *pure* concentrated sulphuric acid. When the mixture is quite cold hold the tube almost horizontally, and pour in gently about an equal bulk of pretty strong solution of green vitriol. The iron solution will float on the acid mixture. Let the tube stand for half an hour, and look at the line of junction of the two liquids. If a dark line is visible the water *does not contain less* than 5 parts of nitrogen in 100,000, though of course it may contain more. This is equal to a previous sewage contamination of 5000 in 100,000.

Now for the use to be made of this determination. If the water is from a deep and apparently unobjectionable well, and if the general characters are good, the water need not be condemned, for chalk water often contain more nitrogen. If the water is from the river or surface-well of tolerably good character, the indication is sufficient to throw a very grave suspicion on it. And lastly, if the history of the water is bad, if it is known or strongly suspected to be contaminated, the indication stamps it at once as certainly dangerous.

By varying the concentration of the water it is possible to arrive at a pretty fair idea of the quantity of nitrogen in the water. Some water reacts without any concentration.

4. *Chlorine.*—We have on a previous occasion pointed out the value of this indication. By an examination of the best water a neighborhood affords, it is easy to find the amount of chlorine which is natural to the water. In the south of England it seldom amounts to more than 1 part in 100,000 except where sea water penetrates. Purely local causes may of course produce an excess, but not very often. The determination may be made with sufficient exactness in the following manner:—Dissolve 88.3 grains of pure nitrate of silver in 1 pint of distilled water, and dissolve separately 4 grains of yellow chromate of potash in ½ pint of water. Take 4 ounces of the water to be examined in a tumbler or beaker; add 10 minims of the chromate solution, then the silver solution, a drop at a time from a minim glass. As soon as the faintest tinge of red appears, read off the number of minims of silver solution which have been added. Every minim indicates 0.1 part of chlorine in a 100,000 of the water, so that uncontaminated water ought not to require more than 10 minims to give the red tint in 4 ounces.

5. *Permanganate test.*—The great objection to the last two methods is, they only tell of a previous contamination which may possibly have ceased to be noxious. Of the methods which tell of the present condition of the water, the only one which can be easily applied is the permanganate test, which, unfortunately, is the least trustworthy of them. It depends on the fact that many kinds of organic matters, and particularly putrescent organic matters, are oxidized by permanganate of potash in presence of sulphuric acid. The permanganate, losing its oxygen, loses its beautiful violet colour and the amount of permanganate decolorized by a given volume of water is therefore some kind of measure of the amount of organic matter in the water. Unfortunately, however, different kinds of organic matter affect the permanganate very differently. Some, urea for instance, do not affect it at all, and, on the other hand, some mineral matters, such as nitrites, sulphites, and protosalts of iron, decolorize it easily. Nevertheless, water which decolorizes much permanganate is generally bad water, and we therefore give the test for what it is worth. Dissolve 3.3 grains of pure permanganate of potash in one pint of distilled water. Take one pint of the water to be examined, introduce it to a colorless flask, add 5 fluid drachms of dilute sulphuric acid (1 part strong acid to 5 parts water by measure) and add the

permanganate from the minim glass a little at a time, as in the chlorine process. After every addition shake the flask and let it stand ten minutes. If the violet color disappears, add a little more, and so on, until the violet color, not a brown, remains permanent for ten minutes. If the quantity required is large it is better to dilute another portion of the water with distilled water and begin again. Each minim of permanganate used in this process represents .001 part of oxygen given up to 100,000 part of water. To give an idea of the working of the test we may quote the results of its application to the London waters in 1865. For the quantities of material given above, the permanganate used may be said to have varied from 5 to 200 minims. Accordingly the quantity of oxygen required to oxidize the organic matter in 100,000 parts of water was taken as varying from 0.005 to 0·2 part.

That these methods are rough we freely admit, but we believe they may be safely used, with due care, in those cases in which a proper scientific analysis cannot be obtained.—*From the London Lancet.—Canadian Pharmaceutical Journal.*

NOTE ON THE TRIPLEX PILL OF DR. JOHN W. FRANCIS.

BY EDWARD R. SQUIBB, M.D.

Many years ago the well-known Dr. John W. Francis used a pill which he called triplex, and which became so popular as to be widely known beyond Dr. Francis's own locality. It originally consisted of equal parts of socotrine aloes, scammony, and mercurial pill mass, in a pill of three grains.

During the latter part of the professional career of Dr. Francis he modified the formula for the then well-known triplex pill, and the modification was generally accepted as an improvement. The pill was then long prescribed by physicians and used by hereditary transmission to families simply as triplex pill, and its composition neglected and forgotten except by the pharmacists who made them, and finally the pharmacist who principally served Dr. Francis before his death, alone had the formula.

Some ten years ago, when the writer was serving as a committeeman of the New York Academy of Medicine in preparing a report on the United States Pharmacopœia, previous to its revision, he applied to the son of Dr. J. W. Francis, the present Dr. Samuel W. Francis, for the improved formula of his father, with a view to its republication. Dr. S. W. Francis examined his father's papers, but without finding the formula, but informed the writer that Messrs. Delluc & Co., pharmacists, had made the pill for his father, and continued still to make and sell them. The writer then applied to Mr. Delluc for the formula, but it was refused, and the subject was dropped.

Recently, however, Dr. Samuel W. Francis, in a note to the writer, sent a formula for the pill, saying that he obtained it from Messrs. Delluc & Co., and communicated it for publication.

Although the pill, under the close policy of Messrs. Delluc & Co., has declined in its general use of late years, it is still highly valued by many physicians as one of those happy combinations which grow out of the long experience and fertile resources of eminent men in the profession of past years. When it is remembered how successful these men were in their practice, and hence what a hold upon the confidence of the community they have handed down to the profession of the present day, it does not seem wise to lose or disregard the agencies by which they reached their beneficent results.

The formula for Dr. Francis's triplex pill is as follows:

Take of—

Powdered Socotrine Aloes,	of each	1 troy ounce.
Powdered Scammony,		
Mercurial Pill Mass,		
Croton Oil, ...		20 minims.
Oil of Caraway, . , . .		1½ fluid drachms.
Tincture of Aloes and Myrrh, or Elixir Proprietatis of Paracelsus,		2 "

Mix the ingredients well together by very thorough trituration, make a pill mass, and divide the mass into four hundred pills.

The usual aperient or laxative dose is one pill at bedtime until the natural condition is restored.—*Proceedings Am. Phar. Association.* 1872.

BROOKLYN, August, 1872.

VEGETABLE WAX IN PHARMACEUTICAL PREPARATIONS.

BY GEORGE C. CLOSE.

Query.—Does the vegetable wax known in trade as Japan wax possess any advantage over beeswax in pharmaceutical preparations?

I find on trial that a small portion of white wax placed in a capsule in a water-bath becomes liquid when the temperature of the water reaches 154° Fahr. It congeals again when the temperature is reduced to 150°. Japan wax, under the same circumstances, becomes liquid at 126°, and congeals again at 110°.

Simple cerate made with white wax liquefies at 138°, and congeals at 132°. When made by substituting Japan wax for the white wax it liquefies at 122° and congeals again at 98°. I infer from these facts that Japan wax is not a true variety of wax, but it resembles stearin more than wax in its properties. It is more plastic than stearin at the temperature of the body, but not so much as either white or yellow beeswax.

I do not suppose that beeswax possesses any therapeutical properties apart from the fact that it is not irritating, and that it raises the point of liquefaction of the oils used in combination with it in ointments and cerates, and by its plactic property produces the consistence required.

I believe that these objects may be better effected by the use of beeswax that Japan wax, and have not as yet discovered any advantages in the use of Japan was over beeswax.—*Proceedings of the American Pharmacutical Association.* 1872.

NOTE ON THE SULPHYDRATE OF CHLORAL (CHLORAL SULPHIDE) AND ITS PHYSIOLOGICAL ACTION.

BY M. HENRY BYASSON.

[*Translated from the French by H. S. Cheever, M.D.*]

On submitting anhydrous chloral to a current of dry sulphuretted hydrogen, at ordinary temperature, this gas is absorbed, and, if the current is sufficiently rapid, a very sensible elevation of temperature is produced. In a short time the liquid anhydrous chloral becomes almost solid, and to terminate the reaction it is necessary to raise the conducting tube, so that it shall flow upon the surface. At the end of about twenty-four hours the reaction ceases. The substance formed is completely solidified, white, presenting at the surface some portions colored reddish yellow. On purifying this body, at first by distillation, afterwards by crystallization with ether or anhydrous alcohol, there is obtained pure sulphide of chloral which presents the following characters: It is white, of a very disagreeable odor and a peculiar taste which recalls that of chloral hydrate. It crystallizes on slow evaporation from its solution in ether, anhydrous alcohol, or chloroform, either in rhomboidal plates or in right four-sided prisms. It melts at about 770° and boils at a temperature of 133 degrees under a pressure of 0.7385.* It evaporates in the same manner as camphor, and its vapors blackens at a great distance moist paper impregnated with a soluble salt of lead. It is soluble in all proportions in anhydrous alcohol, ether, and chloroform. In the presence of water it is slowly decomposed with deposition of sulphur, formation of sulphuretted hydrogen, which is set free, of chlorhydric acid and chloral hydrate, which may be found in the water, and of a small quantity of a liquid which subsides and which presents the characters of tetrachloride of carbon. It is certain that in the presence of water the reaction is very complex, because the sulphuretted hydrogen exercises its reducing action upon the group $C_4H\,Cl_3O_2$ as is proved by the deposit of sulphur, and the formation of chlorhydric acid and the chloride of carbon.

Under the influence of hydrated alkalies or ammonia, in watery solution, the reaction is rapid at a low temperature, the liquid assumes a yellowish brown color, and some chloroform subsides. The solution contains some sulphydrate of the sulphide of the alkali metal and some formiate and chloride of the same base. This reaction, analogous to that which chloral hydrate presents, and in which the formation of the chloride is secondary, may be represented by the following equation:

$$C_4HCl_3O_2,2HS+2(KO,HO)=$$
$$C_2HCl_3+C_2HKO_4+KS,\ Hu+2HO.$$

Submitted to the action of concentrated nitric acid, the sulphydrate of chloral oxidizes rapidly, the disengagement of nitrous vapors is intense; hence the reaction should be produced with a small quantity at a time.

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* The figures in this sentence are evidently erroneous.

In the liquid may be found sulphuric and trichloracetic acids, the existence of which may be shown by the production of chloroform on the addition of potassa, and which we have isolated by distillation. This reaction may be expressed by the following equation:

$$C_4HCl_3O_2,2HS+4(AzO_5, HO) = C_4HCl_3O_4+2(SO_4H)+3AzO_2+AzO_2+4HO.$$

Cold concentrated sulphuric acid has no marked action. When hot there is produced anhydrous chloral with disengagement of sulphuretted hydrogen and sulphurous acid, and a deposition of sulphur.

On cautiously oxidizing this compound by means of nitric acid with the addition, at the close of the reaction, of chlorate of potassa, and estimating the sulphuric acid produced in the form ot sulphate of baryta, we have obtained from 0.50 grammes, and as a mean of three comparative trials 0.635 grammes of sulphate of baryta, a quantity approximating sufficiently 0.642 grammes which must be found to allow of the formula $C_4HCl_3O_2,2HS$. Relying partly upon the preceding reactions and partly upon the estimation of sulphur we represent the formula of this body by $C_4HCl_3O_2,2HS$. It may be seen that the formula for the sulphydrate is nothing but that of the hydrate with the water replaced by sulphuretted hydrogen.

PHYSIOLOGICAL ACTION OF SULPHYDRATE OF CHLORAL.

This body being decomposed by water and non-anhydrous alcohol, its administration presented some difficulties. The animals (Guinea pigs) having received hypodermically doses of this drug varying from 0.20 grammes to 0.60 grammes dissolved in ether, presented the following phenomena (we took care each time to make comparative experiments upon two similar animals, one of which received an injection of ether):

Diminution of temperature about 1° (39:2 to 38:3—muscular relaxation with quiet sleep during about two hours; no notable alteration of the sensibility, slight acceleration of the heart beats. After the sleep the animal rapidly returned to its normal condition.—*Mich. University Jour.*

HOW TO USE CARBOLIC ACID.

Doctor A. E. Sanson has published an excellent monograph upon the properties and uses of carbolic acid, from which we abstract a list of formulæ, together with some criticisms by the German chemist, Dr. H. Hager:

1. Acidum carbolicum liquefactum. Nine parts acid. carbol. puriss and one part aqua destillata, or fifteen parts acid. carbol. pur. and one part alcohol; this latter remains liquid at all temperatures.

2. Solutio acidi carbolici aquosa. Add a little alcohol and dissolve in 20 parts water.

3. Acidum carbol. alcoholisatum. Equal parts carbolic acid and 90 per cent. alcohol. This serves for the preparatron of alcoholic prescrip-

tions of carbolic acid; it is very strong, and must be used by itself with great caution.

4. Acidum carbolicum ætherisatum. One hundred parts ether, one part carbolic acid.

5. Acetum carbolicum. Acetum vini four parts, acid. carbol. one part. Used for disinfecting, but is too strong for weak lungs.

6. Glycerinum acidi carbolici. One part carbolic acid, four parts glycerin; is too strong, according to Hager.

7. Glycerinum carbolicum dilutum. One hundred parts glycerine, one part carbolic acid.

8. Syrupus acidi carbolici. One hundred parts sugar syrup, one part carbolic acid.

9. Linimentum acidi çarbolici. *a*, Alcohol 50 parts, carbolic acid one part; *b*, olive oil seven parts, carbolic acid one part; better nine parts oil (Hager).

10. Solutio desinficiens composita—Compound disinfecting solution. Water 1,000 parts, carbolic acid 10 parts, zinc or iron vitriol three parts. As carbolic acid does not decompose sulphuretted hydrogen and carbonate ammonia, the addition of the metallic sulphates is necessary for complete disinfection.

11. Suvern's disinfecting mass. Unslaked lime 1½ bushel, fluid carbolic acid 10 pounds, chloride of magnesium 15 pounds. The chloride of magnesium changes the lime to deliquescent chloride of calcium and liberates the magnesia. If lime alone is used it is apt to clog the pipes.

12. Terra carbolisata—Coal tar earth. One hundred parts sifted loam, two parts fluid carbolic acid. Excellent for the extermination of noxious insects.

13. Solutio acidi carbolici cosmetica—Carbolic cosmetic. Acid. carbol. cryst. 10 parts, essence de millefleur one part, tinctura quillayae 50 parts, water 1,000 parts. The quillaya tincture replaces soap, and serves as a cosmetic and disinfecting wash, especially for the hands, and also as protection against insects. For use dilute with 10 parts water.

14. Aqua dentifricia carbolisata—Carbolic tooth wash. Water 500 parts, tinctura quillayae 50 parts, carbolic acid 10 parts.

15. Unguentum acidi carbolici—Carbolic ointment. Lard 100 parts, carbolic acid one part.

16. Unguentum glycerini carbolisatum—Glycerin carbolic ointment. Three parts starch are rubbed up to a paste with 20 parts hot water and one part olive oil, three parts glycerin, and one part carbolic acid, intimately incorporated with it in a mortar. The mass has the consistence of a soft gelatin, and is admirably adapted as a salve.

17. Oleum carbolisatum—Carbolic oil. Nine parts oleum lini coctum and one part carbolic acid.

18. Lutum acidi carbolici—Carbolic lute. Make a paste of six tablespoonfuls carbolic acid and sufficient prepared chalk.

19. Emplastum plumbi antisepticum — Antiseptic lead plaster. Twelve parts each of olive oil and litharge, three parts yellow wax, two and a half parts crystallized carbolic acid. Half of the olive oil is heated over a fire, and the litharge stirred in until the mixture is toler-

ably thick, the second portion of the oil is then added, afterward the wax, and, when it is cold, the carbolic acid. The plaster can be spread on cloth or run into sticks, and will keep if properly packed.

20. Emplastum laccæ carbolicum—Carbolic shellac plaster. Three parts shellac, one part carbolic acid. Hager prefers 10 parts shellac and two parts carbolic acid.

21. Ceratum carbolicum—Carbolic cerate. *a*, Liquid carbolic acid three parts, one and one-half parts each of nut oil and yellow wax, six parts melted paraffine; *b*, two parts liquid carbolic acid, one part olive oil, one part wax, five parts paraffine.

22. Antiseptic muslin gauze. Sixteen parts paraffine, four parts resin and one part carbolic acid are melted together and intimately mixed and the cloth immersed in the fused bath and pressed: serves for wound bandages and as a substitute for lint.

23. Carbolic powder. Crystallized carbolic acid five parts, alcohol five parts, 100 parts of lycopodium or gypsum.

24. Acetum carbolicum. Acid. acet. pyrolignosum 20 parts, carbolic acid five parts, water 75 parts. Used for skin diseases and disinfecting clothing.

25. Carbolic acid gargle. Acidum carbolicum 20 drops, acid. aceticum two grams, honey 60 grams, tincture of myrrh eight grams, water 200 grams. The acetic acid and carbolic acid must be united by vigorous shaking.—*Jour. of Applied Chemistry.*

ON GETTING RID OF THE ACCUMULATION OF SAL AMMONIAC IN MINERAL ANALYSIS.

BY J. LAWRENCE SMITH, LOUISVILLE,

About twenty years ago, in a publication made upon the analysis of the natural silicates, I gave the details of some interesting experiments made upon the removal of sal ammoniac, which so commonly accumulates in these analyses.

The method of accomplishing the removal of this salt being embodied in a lengthy paper embracing many other and more important points, has been to a great extent overlooked by analytical chemists. I have been frequently asked for details in connection with the removal of this salt, and some recent investigations have given me renewed appreciation of the invaluable nature of the process, where very large quantities of sal ammoniac had accumulated, and remained associated with a very minute quantity of material that formed the subject of research.

It may be of interest to bring this process more clearly to the attention of chemists. The manner of proceeding is as follows: The solution containing the sal ammoniac is concentrated in a capsule, best over a water bath, or in a glass flask; pure nitric acid is added, about three grammes of it to every gramme of sal ammoniac supposed to exist in the liquid; a little habit will suffice to guide one in adding the nitric acid, as even a large excess has no effect on the accuracy of the analysis.

The flask or capsule is now warmed very gently, and before it reaches the boiling point of water, a gaseous decomposition will take place with great rapidity. This is caused by the decomposition of the sal ammoniac. It is no advantage to push the decomposition with too great rapidity; a moderately warm place on the sand-bath is well adapted for this purpose. I, however, prefer a porcelain capsule, of about three and a half to four inches diameter, (in the ordinary operations in mineral analysis) inverting a clean funnel of smaller diameter over it and evaporating to dryness, over the water bath; at the end of the operation the heat can be increased to four or five hundred degrees.

By this operation, which requires no superintendence, one hundred grammes of sal ammoniac may be separated, as easily and safely as one gramme, from five milligrammes of alkalies, and no loss of the latter be experienced.

The following are some experiments made with given quantities of sal ammoniac and nitric acid; heated thus in a capsule over a water bath.

	Treated with Nitric Acid.	Sal. Am.
5 grammes of Sal Am.	5 c. cent. left.	3.190 gram.
5 " " "	7 " "	2.610 "
5 " " "	10 " "	.790 "
5 " " "	13 " "	.010 "

The decomposition commences before the temperature reaches 140° Fahr. The results of the decomposition were fully explained in a note to an article of mine published in the Am. Journ. of Science, March, 1853. It results principally in the formation of Protoxide of nitrogen and chlorine, the former constituting over seven-eighths of the gas formed.—*American Chemist.*

IODIZED ALBUMEN AND IODIZED ALBUMEN WITH FERRIC CITRATE.

Professor Luigi Guerri, of Florence, has been studying the question whether it be possible to employ the white of egg to prevent the decomposition of ferrous iodide, and to obtain a combination which should contain one part of iodine to five parts of oxide of iron. In order to investigate the action of iodine upon albumen, Professor Guerri saturated it with dilute phosphoric acid, collected the liquid, evaporated the solution of albumen to 3° Beaume, and afterwards added finely divided iodine, obtained by precipitating tincture of iodine with water. This caused the albumen to turn red, but after some time, when stirred, it regained its primitive color. These changes of color occurred repeatedly after additions of iodine, until at length the red color remained persistent and mucilage of starch was colored blue. When the point was attained the liquid was agitated, and, after standing ten or twelve hours, it again regained its original color; it then no longer gave the reaction with starch, except under the influence of chlorine water or nitric acid containing hyponitric acid. Even these were not sufficient to set free some portion of the iodine, it being necessary to incinerate with potash in order to obtain it in the state of iodide of potash. Professor Guerri found afterwards that even during the evaporation of the albumen to dryness the iodine remained in combination, and that during the process some white flakes appeared, which separated upon standing, and redissolved in a very small quantity of potash.

According to careful experiments of Professor Guerri, 100 parts of this iodized albumen, that had been dried at 66° C., contained 3.132 parts of iodine; and 474 parts of solution of albumen of 3° Beaume density when so evaporated yielded 31.928 parts of iodized albumen, whilst 31.928 parts of iodized albumen contained 1 part of iodine. The iodized albumen forms yellow transparent scales, soluble in water, with the exception of a few flakes which are not dissolved by the acetic acid or phosphoric acid, but are dissolved by alkalies. The solution is precipitated by alcohol, is neutral, and gives no iodine reaction.

In order to obtain a ferruginous preparation of the strength before mentioned, Professor Guerri dissolved 18 parts of ferric citrate,—corresponding to five parts of ferric oxide,—in 474 parts of solution of albumen, 3° Beaume density, previously iodized, and evaporated the solution at a temperature of 60° C. to dryness. This gave 50 parts of a compound containing one-third of ferric citrate and two-thirds of iodized albumen. The product so obtained has the appearance of ferric citrate, but is a little yellower. The solution comports itself similarly to the iodized albumen. The iron is not separated from it by alkalies, or by ferrocyanide of potassium, but is separated by the alkaline sulphides.

Each of these preparations is easily formed into a pill mass with simple syrup, as well as with extracts not containing much tannic acid. They can also be administered in powder.—*From 'L' Union Pharmaceutique,' vol. xiii. p.* 289.—*Pharmaceutical Journal and Transactions.*

PREPARATIONS OF PHOSPHORUS.

In a prize essay in *Transactions of the American Medical Association* for 1872, Dr. Saml. R. Percy proposes the following preparations of Phosphorus:—

Take a good sample of olive oil, almond oil, or lard oil, beat it slowly in a Florence flask or porcelain capsule to 480° F. The heat should be gradually raised so that half an hour should be consumed before the oil is brought to this temperature. Let it stand till cool, then filter it into a clean, well-dried bottle. Into this bottle add transparent fragments of phosphorus, in the proportion of one grain of the phosphorus to every 100 minims of the oil. Place the bottle in a bath of water at 180° F., and agitate until dissolved.

To prepare a *solid oil*, which may be used in pill or capsules: Heat a quantity of cocoa butter in a porcelain vessel to a temperature of 400° F., filter whilst hot, and cast into thin sheets which can easily be broken. Take of this a weighed quantity, melt over a water bath, and for every

100 grains add one grain of transparent phosphorus in small pieces; dissolve. When almost cold, add one or two drops of naphtha to deprive it of its luminosity. This may be either poured while warm into gelatine capsules, or it may be poured into shallow dishes. When cold, small pieces may be easily and dexterously reworked in a porcelain mortar into a pill-mass, and quickly rolled out into pills, which may be coated with gelatine, collodion, or white shellac dissolved in strong alcohol; each grain equals $\frac{1}{100}$ gr. of phosphorus. Mutton suet may be substituted for the cocoa butter.

Dr. Percy states that there is in brain a comparatively large amount of an alkaloidal hypophosphite containing both glycerine and nitrogen, which forms a base to the lower oxide of phosphorus, and proposes to imitate this salt in the following preparations: No. 1 for pill use; No. 2 for use as a solution.

Take of purified cocoa butter or of beef tallow prepared in the same manner, 1,000 grains, put into a Wolf's apparatus or a clean, wide-mouthed, eight-ounce vial, to which a cork has been adjusted, with two glass tubes, one passing to the bottom of the bottle, and the other terminating near the cork; add 100 grains of Valentine's beef extract. Put on a water bath, and keep it for some time at 212° F., agitating frequently to mix the beef extract and fat well together. Add eleven grains of phosphorus in small pieces. When the phosphorus is all dissolved, attach an India-rubber tube, connected with a reservoir of oxygen gas under pressure, to the glass tube that leads to the bottom of the bottle. Allow the oxygen gas to pass slowly through the mass, still keeping it constantly agitated and at 212° F. Continue this until all luminosity has ceased, and until all the smell of phosphorus has gone. Take it out of the water bath, allow the oxygen to pass slowly through it, occasionally agitating until the fat begins to become solid, then cork tightly, and leave for a few days. Heat again in a water bath, and if any luminosity is visible, add pure oxygen. Take out the cork and glass tubes, and continue the heat till all the bubbles of oxygen are driven off. Pour into capsules or into cakes, to be made into pills.

No. 2. Take of lard oil, purified, 1,000 grains; Valentine's beef extract (which is more fluid than any other), 100 grains; keep in a water bath at 110° F., agitating to mix the beef extract and oil; add eleven grains of clear phosphorus in small pieces; when all dissolved, bring the temperature to 212° F., and strain; attach the bottle to the oxygen reservoir, and treat it exactly as described in the last formula.

Dr. Percy states that he has used these latter preparations as nerve tonics in a number of cases with very good effect.—*New Remedies, January,* 1873.

A NEW ALKALOID FROM VERATRUM SABADILLA.

According to M. Weigelin, there is a new alkaloid in sabadilla, for which the name of sabadilline is proposed. It is prepared by first making a decoction with water acidulated with sulphuric acid, concentrating and adding alcohol to precipitate the mucilaginous matters. After twenty hours' repose, decant, distil off the alcohol, and precipitate the filtered liquid by ammonia; dissolve the precipitate in ether, and evaporate the latter until it deposits a reddish resinous substance, which may be changed into a whitish powder by a series of solutions and precipitation in water.

The filtered ammoniacal solution contains the sabatrine, which is removed by agitation with amylic alcohol. Distillation is then practised; the residue dissolved by alcohol, containing some water, deodorized by animal charcoal, the alcohol distilled off and ammonia added to the watery residue. The product is agitated with ether, which dissolves out the sabatrine and leaves the pure sabadilline. The latter may be obtained in crystals by means of benzine. It is scarcely soluble in ether. Concentrated sulphuric acid dissolves it with a red color. Ammonia does not precipitate its solutions. Neither the bichromate of potash, the ferrocyanide, or the iodide of potassium react upon it. It is neither a sternatatory or emetic. Its formula is $C_{41}H_{46}Az_2O_{12}$; that of sabatrine, $C_{51}M_{86}Az_2O_{17}$; that of veratine, $C_{52}H_{86}Az_2O_{15}$.—*Journ. de Pharm. et de Chim.*, Sept., 1872.—*New Remedies*, Jan., 1873.

A METHOD OF DETECTING THE FALSIFICATION OF ESSENTIAL OIL OF BITTER ALMONDS WITH NITRO-BENZINE.

BY EDME BOURGOIN.

Some time since I indicated a method of detecting the falsification of oil of bitter almonds with nitro-benzine. It consisted in agitating 2 or 3 grammes of the liquid with a fraction of its weight of solid caustic potash in a test tube. After some moments of shaking, the yellow color (permanent if the oil be pure) changes to a characteristic reddish tint. If the proportion of the nitro-benzine be large, this red color gives way to a green, which disappears in a day or two. These phenomena only are qualitative, and when the results are not marked, leave a doubt. The following plan is both qualitative and quantitative, and certain in its results.

In a flask containing some 100 grammes of emery, and provided with a large opening, there are put from 5 to 10 grammes of the essence, and from 20 to 40 cubic centimetres of concentrated bisulphite of soda; agitate briskly for a few minutes to favor the union of the salt with the oil of bitter almonds. Add rectified ether, which lays hold of the nitro-benzine. Remove the ether with a pipette and repeat the process; in this way all the nitro-benzine is taken up. Evaporate the united ethereal liquid over a sand-bath, and weigh the residue, which is nitro-benzine. To prove that the residue is nitro-benzine, put 4 or 5 drops in a tubular retort containing a pinch of iron-filings, and a little acetic acid at 8 degrees. Heat carefully, so as to obtain in the test tube about a gramme of distilled liquid, neutralize this with lime after the manner of M. Berthelot, and add 2 or 3 drops of the hypochlorite of lime; there will then develope a beautiful violet blue color, which is decisive as to the presence of aniline, *i.e.*, that of nitro-benzine in the primitive liquid. —*L'Union Pharmaceutique*, *August*, 1872.—*New Remedies*, *January*, 1873.

NOTES AND ABSTRACTS FROM VARIOUS SOURCES.

On the Exhibition of Calomel.—The changes which preparations containing calomel undergo by being kept, are discussed by Vulpius, in an article we translate from the *Allgemeine Medicinische Centralzeitung*, March, 1872:

In mixtures of calomel with white sugar, magnesia, or sugar of milk, no signs of corrosive sublimate can be found, even after three months. Traces of sublimate do appear in a mixture of calomel, bicarbonate of soda, and sugar of milk, kept an equal time. Decided quantities were present in a mixture of calomel, bicarbonate of soda, and cane sugar, preserved the same period, and exposed to moisture. The last mentioned is the only preparation which he decides should not be kept on hand for pharmaceutical purposes, but should be freshly mixed when wanted.—*Half-Yearly Compendium.*—*Atlanta Medical and Surgical Journal.*

Preparation of Camphor.—According to M. Bechtinger, in the island of Formosa there is a colony of Chinese who gain a poor livelihood by the preparation of camphor. They use for that purpose a large furnace of clay, into which they introduce a large clay cylinder divided into three superimposed compartments. The lower of these is filled with water. The middle reservoir, which communicates by small orifices with both the others, is filled with the camphor wood cut into very small pieces. When the furnace is lighted, the steam rises through the middle chamber, and, forcing its way amongst the fragments of wood, finally rises to the upper chamber, carrying with it the camphor, which crystallizes in the highest receptacle. The camphor thus obtained is sent to Bangka, and thence to China by the port of Tamsui.—*Journ. de Pharm. et de Chemie, October*, 1872.

Solubilities of Sugar in Dilute Alcohol and in Water.—100 parts (30 alcohol, 70 water) dissolve at 0° C., 65.5 parts of sugar; at 14° C., 67.9; at 40° C., 82.2 parts.

100 parts (50 of each) dissolve at 0° C., 45.9 parts of sugar; 14°, 47.1 parts; at 40° C., 68.4 parts.

100 parts (10 water, 90 alcohol) dissolve at 0° C., 0.7 parts; at 14° C., 0.9; and at 40° C., 2.3 parts.

Absolute alcohol dissolves nothing.

Pure water dissolves at 0° C., 65 parts of sugar per 100; at 15° C., 66.1 parts; at 30° C., 69.8 parts; at 50° C., 82.7 parts.—*M. Scheibler, Deutsche Chemische Gessellschaft.*

New Method for detecting Arsenic for Pharmaceutical Purposes.—Pour on pure tin crystals, stannous chloride, 4–6 cc. pure chlorhydric acid of 1.12 sp. g., shake until solution takes place, and add carefully, 2–3 cc. of the sulphuric acid to be examined, gently agitating. In the presence of arsenic the solution assumes a yellowish, then a brownish, and finally a dark grayish-brown, troubled color. 1.500,000 of arsenious acid may be detected.—*American Chemist.*

Pure Musk.—It is generally believed that this article may best be obtained by purchasing the musk in the bag. This view is opposed by M. Chr. Kunrz, *(Vierteljahrschrift fur Pharm.)*, who states that the pods are more liable to adulteration than the powder. Although one would think that the musk in its natural receptacle would prove the most difficult to imitate, yet the ingenuity of dealers has proved fully equal to the task, and, from the statements of the author, it seems that the purest musk is, most generally, to be found in a powdered form.

Chemical Plants.—Take a glass tumbler, fill it with white, or better, pure yellow sand, to the height of two inches, and pour on a mixture of equal parts of silicate of potash (water-glass) and distilled water. Then drop in small lumps of metallic salts, as sulphate of copper, sulphate of iron, sulphate of zinc, bichromate of potassa, and so on, being careful that no two pieces are touching. In a few hours there will grow up small stems and hair-like threads, filling the whole tumbler as far as the mixture goes.—*Correspondent of Drug. Circular.*

Detection of Iodine.—M. Pellogio has made further experiments with the method which he proposed in 1870, and which consists in electrolyzing the liquid to be tested, previously acidulated with hydrochloric acid. The chlorine evolved sets free the iodine, the presence of which is made evident by its action on starch. He finds it greatly superior in delicacy to the method by bromine-water and starch; and this again, more sensitive than bromine-water and carbon bisulphide.—*Med. and Surg. Reporter.*

Rule for proportioning Doses.—"We do not think any scheme for proportioning doses recommends itself for simplicity more than the one proposed by Dr. R. O. Cowling in the first number of the *American Practitioner*: 'The proportionate dose for any age under adult life is represented by the number of the following birthday divided by twenty-four;' *i. e.*, for *one* year is $\frac{2}{24}=\frac{1}{12}$; for *two* years, $\frac{3}{24}=\frac{1}{8}$; for *three* years, $\frac{4}{24}=\frac{1}{6}$; *five* years $\frac{6}{24}=\frac{1}{4}$; for *eleven* years, $\frac{12}{24}=\frac{1}{2}$, etc. As in the case of Dr. Clarke's rule, we here have a constant denominator; and it will be found on inspection that the quantities more nearly approximate to those given by Gaubius than those obtained by Dr. Young's rule."—*Amer. Practitioner.*

Carbazotate of Ammonia to supersede Sulphate of Quinine.—In a recent communication to the Société de Thérapeutique de Paris, Dr. Dujardin-Beaumetz investigated the character, properties, and uses of carbazotate of ammonia (combination of ammonia with carbazotic, picric, or trinitrophenic acid), especially as a therapeutic successor to sulphate of quinine. After relating the successful employment of this salt in intermittent fever by Braconnot, Calvert, Aspland, Bell, Chazereau des Thureaux, Manopa, etc., Dr. Beaumetz gave the results of six cases treated by himself, and of various experiments carried on upon animals and man. Like quinine, carbazotate of ammonia diminishes the strength of the pulse, and brings on heaviness, cephalalgia, and even delirium, and is eliminated by the kidneys. These effects have again been stated by Dr. Beaumetz.

Dr Beaumetz draws the following conclusions from the various facts observed in his six cases, or brought out by his experiments; Carbazotate of ammonia is very efficacious in intermittent fever; the suppression of the paroxysms may be obtained by the use of two to four centigrammes (one-third to two-thirds of a grain) daily; given in these doses the drug has never had any bad effects, and seems to be better tolerated than sulphate of quinine; the physiological action of the substance closely resembles that of sulphate of quinine.—*London Lancet*, October 2.

Proportion of Caffeine in Coffee and Tea.—In a recent number of *Pfluger's Archiv* Dr. Aubert describes some researches on this substance. Seeking to ascertain the proportion of caffeine or theine in a cup of coffee or tea, he arrived at numerical results somewhat above those of his predecessors. According to him, a cup of coffee, forming an infusion of 16.75 gr. of dry coffee-grains, contains about 0.1 gr. to 0.12 gr. of caffeine; and an infusion of 5 gr. to 6 gr. of dry leaves of very good tea contains about 0.1 gr. to 0.12 gr. of caffeine.—*New Remedies.*

Freezing Point of Bromine.—H. Baumhauer asserts that bromine consolidates not at—7.3, as is commonly believed, but at—24.5°C. Also that it forms not blueish gray, but reddish brown crystalline masses. The old melting point was probably due to the bromine containing water. —*Ibid.*

Test for Phenol.—According to C. Mêne, when bromine is added in excess to a weak aqueous solution of phenol, there is formed a yellowish white precipitate of tribromophenol. This reaction is so sensitive that one part of carbolic acid in 4,370 parts of water can be detected. In case of any doubt arising as to the nature of the precipitate, it is separated by filtration, washed, and put into a test-tube, gently heated along with some sodium amalgam; the liquid is then poured into a beaker-glass, and upon the addition of a few drops of dilute sulphuric acid, the characteristic smell of phenol is evolved, and the substance becomes visible in the form of drops.—*Chemical News*, July 12, 1872.

Cerisin.—According to the *Zeitschrift Oest. Apothek. Verein*, of August 20th, Jos. Faukal, of Vienna, has introduced a substance into commerce, under the name of cerisin, which bids fair to take the place of wax in pharmacy. It is in dazzling white sheets of some lines in thickness, or in small blocks of ½ to 1 pound weight. It has the consistency of wax, is odorless, and makes exceedingly beautiful preparations. It is offered at a much lower price than wax.—*New Remedies.*

Koussin.—In the *Vierteljahrschrift fur prakt. Pharm.*, of July 1, Dr. Karl Bedall has a long paper on *Koussin.* He has prepared it in quantities by a process similar to that by which santonine is obtained, and the experience of thirteen years has shown that it is the active principle of kousso. As he has got it, it is in the form of a yellowish-white powder, of a crystalline appearance under the microscope, but not really crystallized, slightly soluble in water, freely in alcohol, ether, and pure alkalies. He believes it to be of the nature of a resin, and gives its formula as $C_{26}H_{22}O_5$.

Boracic Acid as a Preservative.—According to A Hirschberg, the addition of 15 grains of boracic acid to 2 lbs. of milk will keep it sweet in hot weather for five days. The usefulness of the milk is said not to be impaired, but the cream rises more slowly than normal.—*Ibid.*

Action of Oxidizing Agents on Brucine.—According to M. Luck, if there be added to a mixture of chlorate of potash and brucine, a few drops of sulphuric acid, a red color is produced, exactly similar to that evolved by the action of nitric acid on the same alkaloid; but, in the first case, a few drops of a solution of protochloride of tin decolorize the solution, whilst in the latter they change the tint to a deep violet.

M. Schome has found that chlorine water, ozonized water, chromic acid, chromate of potassa, and hypochlorite of soda (even in very weak solution), offer similar reactions.

Both authors believe that nitric acid reddens the brucine simply by oxidizing it.—*Journal de Pharmacie et de Chimie*, September, 1872.—*Ibid.*

Adulteration of Palm Oil.—G. Tissandier has shown that palm oil is often adulterated with water, even to as much as fifty per cent. Hager confirms this, but thinks that the water is added in the form of a boiling starch mucilage, with one per cent. of potash.—*Vierteljahr fur prakt. Pharm.*—*Ibid.*

On the Preservation of Aromatic Powders.—Reihl has shown that the oil obtained from some powdered cloves, which had been kept in a chest lined with zinc, contained a notable proportion of the metal, and therefore these aromatic powders should be kept in glass or porcelain.—*Ibid.*

A very Sensitive Test for Ammonia.—M. Lex has found that a trace of ammonia in a liquid can be recognized by treating the latter first with phenic acid, and then with chloride of calcium; if ammonia be present a green color will be developed.—*Ibid.*

Croton Chloral Hydrate.—The hydrate of croton chloral, according to E. Schering's latest communication, occurs in small, white, shiny, tubular crystals of peculiar odor, somewhat similar to that of blue-berries, and of a burning taste. Their formula is C_4H_3 Cl_3O and HO. They are soluble with difficulty in cold, easily in hot water, easily in alcohol and ether. By heating they melt and volatilize entirely, yielding exceedingly irritating vapors. Concentrated sulphuric acid deprives them of their water, converting them into pure croton chloral, which floats as a colorless, oily fluid upon the acid, which by warming is entirely destroyed with blackening and the development of muriatic acid. The purity of any sample is easily tested. It must melt at 78°C., fully disappear on heating, and make a clear solution in water and alcohol. The watery solution must be neutral in its reaction, by the addition of nitric acid and a salt of silver separate no chloride of silver, and on the addition of a caustic alkali or its carbonate yield an oily liquid insoluble in water (Allylendichlorid).—*Neues Repertor, fur Pharm.*, Heft 5, Bd. xxi., 1872.—*Ibid.*

Recognition of Phosphorus Poisoning.—M. Poulet stated before the

French Academy of Science that phosphorus is always eliminated in the urine, when taken internally, in the form of hypophosphorous acid, and that taking advantage of this, the existence of phosphorus poisoning can be readily recognized or disproved. To discover hypophosphorous acid in the urine, nitric acid should be added to it, and the whole heated to calcination. If the acid be present, as dryness is reached the mixture suddenly bursts into flame like a packet of matches.—*Gazette Medicale de Paris*, August 17, 1872.—*Ibid.*

Tincture of Eucalyptus.—Take of dried leaves of eucalyptus (cut up) 1 part; alcohol, at 80°, 5 parts; allow to macerate for ten days, then filter.—*L' Union Pharmaceutique.*—*Ibid.*

Wine of Eucalyptus.—Take of dried leaves of eucalyptus, 30 parts; alcohol at 60°, 60 parts; good white wine, 1,000 parts; allow to macerate in the alcohol for twenty-four hours, then add the wine; after ten days, filter.—*Ibid.*

Hydro-Alcoholic Extract of Eucalyptus.—Take of dried eucalyptus leaves (cut up) 1,000 parts; water, 3,000 parts; distil to obtain the essential oil; make an aqueous extract of the material remaining in the apparatus, and to it add alcohol at 60°, 1,000 parts.. Filter the alcoholic solution and evaporate it to the consistency of an extract; when nearly cold, mix the volatile oil thoroughly with it.—*Ibid.*

To Cut and Bore India-Rubber Corks.—Dip the knife or cork-borer in solution of caustic potash or soda. The strength is of very little consequence, but it should not be weaker than the ordinary reagent solution. Alcohol is generally recommended, and it works well until it evaporates, which is generally long before the cork is cut or bored through, and more has to be applied; water acts just as well as alcohol, and lasts longer. When, however, a tolerable sharp knife is moistened with soda-lye, it goes through India-rubber quite as easy as through common cork; and the same may be said of a cork-borer, of whatever size. I have frequently bored inch-holes in large caoutchouc stoppers, perfectly smooth and cylindrical, by this method. In order to finish the hole without the usual contraction of its diameter, the stopper should be held firmly against a flat surface of common cork till the borer passes into the latter.— *W. F. Donkin*, in *Chemical News.*—*Dental Cosmos.*

Detection of Morphia in Quinia.—Dissolve three grains of ferri cyanide of potassium in a fluid ounce of water. Mix twelve drops of this solution with a fluid drachm of water, and add one drop of solution of ferric chloride. The reagent thus prepared is scarcely affected by a solution of pure quinia, but if one ten-thousandth part of morphia is present, a blue coloration is at once produced, and a larger quantity of morphia throws down a precipitate of Prussian blue. The absence of all coloration is proof of the absence of morphia. A blue color, however, does not prove the presence of morphia, as it may be produced by many other deoxidizing agents.

Quinic Acid.—The principal non-astringent acid of cinchona bark, sometimes named kinic acid, has been examined with regard to its physiological as well as chemical properties, by M. Rabuteau, (Br. Med. Jour., Sept. 7, 1872.) Quinic acid separated in the solid state, tastes like tartaric and citric acids, and forms soda and potassa salts which are deliquescent, neutral in reaction, and tasteless. The free acid does not produce any particular physiological effect when taken into the system; the alkaline quinates are oxidized to carbonates in the system, after the manner of citrates, etc., rendering the urine alkaline.—*Michigan University Med. Magazine.*

Manganese in Plants.—A paper on this subject, by Professor Fluckiger, of Bern, was read at the British Pharmaceutical Conference. Manganese was found in many vegetable drugs, in cinchona barks, gingers, peppers, and lobelia leaves, but most abundantly in cardamoms, a single seed of which, burned in a loop of platinum wire and then fused with a little sodium carbonate, gives the green bead. A small spirit lamp is best for this purpose, not blowing away the ash. A determination gave 0.2 per cent. of manganese in dried cardamoms. Some discussion occurred as to the effect of soil upon the mineral constituents of given plants.—*Ibid.*

Signs of Madness in Dogs.—The Council of Hygiene, of Bordeaux, says the *British Medical Journal*, has issued the following instruction: "A short time, sometimes two days, after the madness has seized the dog, it creates disturbance in the usual condition of the animal, which it is indispensable to know: 1. There are agitation and restlessness; the dog turns himself continually in his kennel. If he be at liberty, he goes and comes, and seems to be seeking something; then he remains motionless, as if waiting; he starts, bites the air, seems as if he would catch a fly, and dashes himself, howling and barking, against the wall. The voice of his master dissipates these hallucinations; the dog obeys, but slowly, with hesitation, as if with regret. 2. He does not try to bite; he is gentle, even affectionate, and he eats and drinks; but he gnaws his litter, the ends of the curtains, the padding of cushions, the coverlids of beds, the carpets, etc. 3. By the movements of his paws about the sides of his open mouth, one might think he was trying to free his throat of a bone. 4. His voice has undergone such a change that it is impossible not to be struck by it. 5. The dog begins to fight with other dogs; this is decidedly a characteristic sign, if the dog be generally of a peaceful nature. The numbers 3, 4, and 5, indicate an already very advanced period of the disease, and the time is at hand when man will be exposed to the dangerous fits of the animal, if immediate measures be not taken. The measures are to chain him up as dangerous, or, better still, to destroy him."

Testing Hydrochloric Acid.—A very delicate test for sulphurous and arsenious acid in hydrochloric acid, given in the German pharmacopœia, is worth mentioning. In a test tube are placed a few small pieces of pure zinc, to which is added hydrochloric acid previously diluted with two parts of water, so that about one-tenth of the tube is filled. In the upper part of the latter is introduced some cotton moistened with solution of subacetate of lead, and the mouth of the tube is covered with some filtering paper dipped in solution of nitrate of silver. In case sulphurous and arsenious acid are present, the cotton as well as the filtering paper becomes blackened after the evolution of hydrogen gas has lasted about half an hour. The test is so delicate that $\frac{1}{8}$ milligramme of arsenious acid (1-480 grain) can be detected in 1,000 grammes (two pounds) of acidum hydrochloric by the silver paper becoming distinctly colored.—*Chemist and Druggist.*

Phosphorus Pills.—A writer in the Druggist's Circular gives the following formula for a pill of phosphorus, by which he says they can be made of small size, at short notice, and to keep without evolving fumes: Dissolve one grain phosphorus in half a drachm of chloroform and rub in a mortar with two scruples powdered liquorice root till all the chloroform has evaporated. Add half a drachm powdered soap and work into a mass with water, and divide into twenty-four pills.

Javelle Water.—Old engravings, wood-cuts, and all kinds of printed matter that has turned yellow, are completely restored by being immersed in this preparation for only one minute, without the least injury to the paper, if the precaution is taken to thoroughly wash the article in water containing a little hyposulphite of soda. Undyed linen and cotton goods of all kinds, however soiled or dirty, are rendered snowy white in a very short time by merely placing them in the liquid mentioned. For the preparation of Javelle water, take four pounds of bicarbonate of soda, one pound of chloride of lime; put the soda into a kettle over the fire, add one gallon of boiling water, let it boil from ten to fifteen minutes, then stir in the chloride of lime, avoiding lumps. When cold, the liquid can be kept in a jug ready for use.—*Boston Jour. of Chemistry.*

Polish for Patent Leather.—The following is given by the London *Chemist and Druggist*:—

Whites of two eggs.
One tablespoonful of spirits of wine.
Two large lumps of sugar.
Finely-powdered ivory-black,

as much as may be sufficient to produce the necessary blackness and consistence. To be laid on with a soft sponge lightly, and afterwards gently rubbed with a soft cloth.

East India Method of Cleaning Silver.—The East India jewellers never touch silver-ware with any abrasive substance. For all articles of the kind, even the most delicate, the method of cleaning they adopt is as follows: Cut some juicy lemons in slices; with these rub any large silver or plated article briskly, and leave it hidden by the slices in a pan for a few hours. For delicate jewelry the Indians cut a large lime nearly in half, and insert the ornament; they then close up the halves tightly, and put it away for a few hours. The articles are then to be removed, rinsed in two or three waters, and consigned to a saucepan of nearly boiling soapsuds, well stirred about, taken out, again brushed, rinsed, and finally dried on a metal plate over hot water, finishing the process by a little rub of wash-leather (if smooth work). For very old, neglected, or corroded silver, dip the article with a slow stirring motion in a rather weak solution of cyanide potass.; but this process requires care and practice, as it is by dissolving off the dirty silver you obtain the effect. Green tamarind pods (oxalate of potash) are greater detergents of gold and silver articles than lemons, and are much more employed by the artisan for removal of oxides and firemarks.—*Boston Jour. of Chemistry.*

Lime for Poisoning by Plants and Insects.—A standing antidote for poison by oak, ivy, etc., is to take a handful of quicklime, dissolve in water, let it stand half an hour, then paint the poisoned parts with it. Three or four applications will never fail to cure the most aggravated cases. Poison from bees, hornets, spider bites, etc., is instantly arrested by the application of equal parts of common salt and bicarbonate of soda, well rubbed in on the place bitten or stung.—*Ibid.*

To Promote the Sprouting of Seed.—An English scientific journal states that oxalic acid promotes the sprouting of seeds, so that seeds forty years old will germinate by its application. The method is to soak the seeds for one or two days in a solution of oxalic acid, till they commence to sprout, when they are taken out and planted.—*Ibid.*

To Preserve Fruits.—Use two teaspoonfuls of neutral sulphite of lime to one gallon of fruit, with the usual quantity of sugar. Put in the lime while the fruit is heating, in order that any impurities in fruit or sugar may rise to the top and be removed. Fruit thus prepared, put in jars, and stored in a cool place, will keep for months.—*Ibid.*

Active Hydrogen.—M. Charbrier has demonstrated the existence of an active modification of hydrogen, bearing the same relation to hydrogen in its ordinary state that ozone does to ordinary oxygen. He found that "electrolized" hydrogen would combine directly with nitrogen, and also decompose at ordinary temperatures the oxide of silver. It is not stated whether any change in volume takes place in the electrolized gas.

Apomorphine.—The latest method of manufacturing this alkaloid is by the process of E. L. Mayer (see *Berichte der Deutschen Chem. Gesellsehaft zu Berlin*, 1871, iv., Nr. 2, S. 121), who produces it by treating morphia with a solution of chloride of zinc at 130° C.

Preparation of Spirits from Lichens.—According to Dr. Arendt, in the Russian Provinces of Archangel, Pskow, etc., a spirit is prepared from lichens and mosses, by fermentation and distillation. This "moss-brandy" is said to be of fine flavor, and its preparation to yield a net profit of from 40 to 100 per cent.—*Chemical News*, September 6, 1872.

Constitution of Tannic Acid.—Since the experiments of Strecker, it has been thought that tannic acid is a union of gallic acid and sugar. Schiff (*Berichte der Deutsche Chem. Gesell.*, iv. 231), has furnished proof that this is not correct. He found that gallic acid was changed by treatment with PCl_3O_2 in warmth into tannic acid, also in the same way by arsenious acid.

The formula expressing the change is
$6(C_{14}H_6O_{10})$ [gallic acid] + $2(PCl_3O_2) = 3(C_{28}H_{10}O_{18})$ [tannic acid] + $6HCl_2 + PO_5$. That is, 1 equivalent of tannic acid and 2 equivalents of water equal 2 equivalents of gallic acid.

Thus $(C_{28}H_{10}O_{18}) + 2HO = 2(C_{14}H_6O_{10})$.

PHARMACEUTICAL SIFTINGS AND GLEANINGS.

The cultivation of the white poppy for the production of opium, is said to be meeting with marked success in Tennessee. The plants are larger and more vigorous, and the capsules from two to ten times as large as those from the imported seed.

The mesquit gum of Western Texas is almost identical with the gum arabic, and during the past year has become an article of expôrt, some 12,000 pounds having been gathered in Bexar county, and as much more between that and the coast.

The manufacture of palmetto leaves into paper is soon to be put into practical shape in Lowndes county, Georgia. The process is said to be very successful.

Artificial ivory is said to be composed of ten ounces white shellac, four and a half ounces of acetate of lead, eight ounces of ivory dust, and five ounces of camphor. The ingredients are reduced to fine powder, heated and mixed, then pressed in heated moulds into sheets or other desired forms.—*Medical Press.*

An examination for impurities of sugar was made of 36 samples obtained in the shops of Glasgow, and was found that the cheap grades are more or less impure, containing woodyfibre, common salt, grape sugar, water, and acari or sugar lice.—*Ibid.*

To protect delicate drawings in pencil or chalk, such as are easily smudged if roughly handled, and to give them more permanence and solidity, it is well to coat them with collodion. The same may, if desired, be used with an admixture of paraffine, stearine, or castor oil, and affords them an excellent coating. Pencil sketches are in this way rendered clearer, and may therefore be copied the more easily when so treated.—*The Lens.*

Prof. Leidy remarked at a late meeting of the Academy of Natural Sciences of Philadelphia, that during the prevalence of small-pox, he was reminded of an opinion he had long entertained, that flies were probably a means of communicating contagious disease to a greater degree than was generally suspected. Recently he noticed some flies greedily sipping the different matter of some fungi of the *Phallus Impudicus.* He caught several and found that on holding them by the wings they would exude two or three drops of liquid from the proboscis, which examined by the microscope were found to swarm with the spores of the fungus. The stomach was likewise filled with the same liquid, swarming with spores.

G. Bouchardat states in the *Journ. de Pharm. et de Chem.*, that he has determined the fruit of *Achras Sapota* to contain sugar of milk. This is the first instance known where sugar of milk has been found as a constituent of plants.—*Dittsteins viertel jahres-schrift.*

A commercial article of annato was found by Schrage (Archive der

Pharmacie) when dried to yield to alcohol but ⅓ of its weight of soluble coloring matter, the other ⅔ consisting of gum.—*Ibid.*

The *Apotheker-Zeitung* recommends the following test for the purity of Balsam of Peru: Dissolve 1 part of chloride of sodium in 5 parts of distilled water, so that the solution has the sp. gr. 1.125, and drop into this solution the Balsam of Peru, which from its greater sp. gr., 1.140 to 1.160, will sink to the bottom. If this does not take place there is an adulteration present, and it is well to examine for castor oil, copaiva, etc.—*Ibid.*

J. Casthelaz (Compt. Rend.) gives the following process for purifying commercial crude tallow: Place in 100 parts of boiling water 100 parts of tallow, when the tallow is liquified add 4 parts of crystallized carbonate of soda, previously dissolved in 20 parts of water, and stir until a perfect emulsion has been formed, heat now to the boiling point, and add with constant stirring 400 parts of water. Let the mixture get cold and remove the water by means of a syphon. To remove the still adherent alkali, emulsify again with 100 parts of boiling water, and repeat the washing with 400 parts of water. If by this manipulation the tallow has not lost all its disagreeable odor, repeat the operation with a fresh solution of carbonate of soda.—*Ibid.*

According to Dr. Schwabe (Berichte der deutschen chem. Gessellschaft), cows' milk can be preserved by the addition of one drop of etherial oil of mustard to 20 grains (about 5½ drachms) of milk.*—*Ibid.*

A. Hirschberg (Archive der Pharm.) recommends a few drops of sulphuric acid to be added to a solution of gum arabic, for its preservation. —*Ibid.*

EDITORIAL DEPARTMENT.

"THE ALTERATION OF OUR PRESCRIPTIONS BY DRUGGISTS."

Such is the title of an article lately communicated to the *Medical Record* by Dr. Fordyce Barker, of New York, and which with characteristic exaggeration has formed the topic of editorial comment by the daily secular press.

From the oracular expressions of the latter, if the public did not appreciate the specious value of such diatribes, it might be inferred that in the hands of druggists, a most outrageous system of swindling had been reduced to the exactness of a science. Dr. Barker's statements, however, deserve more serious attention, and we believe our readers will gladly peruse the article which we here reproduce.

*** Is the quantity of etherial oil of mustard to that of milk not an error? No doubt there are many other essential oils, like oil of cloves, and other articles that will preserve milk when added in this large proportion. But the querry arises with us of what use is such milk?—A. E. E.**

TO THE EDITOR OF THE MEDICAL RECORD:

SIR,—In a conversation a few weeks since with a medical student who had served two years as a clerk in one of our city drug-stores, he informed me that he was directed by the proprietor, when putting up expensive medicines, to put in only one-half the quantity ordered in the prescription. For example, if in a four-ounce mixture one drachm of quinine was ordered, he was to put in but half a drachm.

It is not to be supposed that this rule has been generally adopted by the druggists, but I have some reason for believing that the instance I have referred to is not entirely exceptional. Other information which I received from the same source has induced me to adopt the rule of thoroughly examining all powders and mixtures which are prepared from my prescriptions, and I carefully interrogate patients as to the action of pills, to ascertain whether this corresponds with the effects I anticipated from the ingredients ordered. The experience of a few weeks has convinced me that this course is not only wise but absolutely necessary. It has awakened my attention to the inquiry as to how much our success in treating disease, and, consequently, our reputation as practitioners, is in the hands of the druggist who puts up our prescriptions.

As an illustration of this point, permit me to mention a few incidents that have occurred in my practice within the past six weeks.

I was called about 3 A.M. this morning to see a little boy, five years of age, the only child of a widow, who is constantly on the watch for diphtheria. The child had a cold with sore throat and some disturbance of the digestive organs, and I wrote the following prescription:

℞ Potass. bicarb.,
"Tully's powder," aa....gr. x.
Hydarg. chlor. mite .....gr. iij.
M. Div in Chart No. 2. S. One to be taken at once.

On visiting the child at ten this morning I found that he had not slept, was still feverish, and complaining of his throat. The anodyne effect which I had anticipated from his medicine had not been produced. This led me to examine the remaining powder, when I saw that there was no Tully's powder in it. Of course, the camphor in this would be unmistakable both to the smell and the taste. The powder is of a dingy white color, with an alkaline taste. I then rewrote the prescription and sent it to a trustworthy druggist. After taking one powder the child soon fell asleep, in a gentle perspiration; and on visiting him at five o'clock this afternoon, I found him asking for food, with no sore throat, and so well that I shall not again visit him unless I receive a new call. It was sufficiently vexatious to find that my night visit had been made entirely useless by the fault of the druggist, although the only harm done was the loss of time in relieving the child from suffering and the mother from anxiety. But suppose the case had been one of superficial inflammation of the larynx and trachea, or commencing catarrhal laryngitis, my prescription would have been very much the same, and it is my firm conviction that, in such a case, the loss of six hours' time might have resulted in converting a simple and easily-managed case into one of very great danger, viz., croup.

About three weeks since I was called to see a lady suffering from a severe form of ulcerative stomatitis. In the treatment of this affection, for a few years past, I have mainly relied upon the sulPHITES either of magnesia or soda, and I have cured my cases more rapidly than I formerly did, when I depended upon the chlorate of potassa, borate of soda, etc. When writing for either of the sulPHITES, I have always written the word out in full, doubly underscoring the last syllable, so that the attention of the druggist should be called to the article required. In this case, I wrote a prescription for a mixture in which the sulPHITE of magnesia was the chief ingredient, and then assured the lady with a good deal of confidence that her mouth would be much better in a couple of days. Early on the second morning after my visit, I received a summons to visit her again, and found that she had not been able to eat or sleep since my former visit, and that she now had a bad diarrhœa. I was much disappointed, and questioned her in regard to the medicine that she had been taking, and her answers convinced me that she had not been taking the sulphite of magnesia. Taking the phial of medicine, I called upon the druggist where it had been prepared. Being an entire stranger to the shop, I thought it safe to use a little diplomacy in getting at the truth. I first asked the "young gentleman" in charge to show me his sulphate of magnesia, which he readily did, informing me that it was the same as Epsom salts. I then asked if he had but one kind, and always put that up when ordered; both of which questions were answered satisfactorily. I then showed him the phial, asking if he was sure it was the same article which was put up in that. He then looked at his prescription-book and then answered, with some temper in his tone, that it was, adding: "Do you think that we have put up oxalic acid? We never make such mistakes in this store." I then asked to see the prescription, to which he at first objected, but after a little persuasion he consented. I then asked the meaning of the two lines drawn under the last syllable of sulphite. He said: "Because it was spelled wrong. It should be a-t-e. But doctors were sometimes very careless in their spelling, and in my opinion some of them did not know any better." His last proposition I did not then feel inclined either to discuss or to dispute. But keeping a sober face, I gravely thanked him for his information, and left, satisfied—perfectly satisfied—that it was my duty to warn my patients not to have their prescriptions made up at this shop. I subsequently wrote a note to the proprietor of this store, detailing the above, to which note I have received no reply, and hence I suspect my conversation was with the proprietor.

In a third case, I had ordered for a child the subcarbonate of bismuth. At my next visit I was told that each powder seemed to distress the child, and caused severe vomiting. This led me to examine the powders, and not liking their appearance, I called upon the druggist who had put them up, and asked him to show me the subcarbonate of bismuth. He then took down a jar labelled Bism. Subnit. On my remarking that this was the subnitrate, but I wished to see the subcarbonate, his answer was, "Oh, this is what we always put up now. The subcarbonate is an old-fashioned article that is out of date now, except with old fogies."

Now each of these incidents occurred at drug-stores of marked pretensions as to external display, situated in the best parts of the city, and which rely for their support on that class of society able to assist in paying their high rents.

I suspect that few of us reflect how much we and our patients are at the mercy of druggists. I have no doubt that most physicians, if they carefully watched, could furnish illustrations parallel with those that I have given.

The relation between the physician and druggist is one of mutual dependence. Both are liable to make mistakes, and no doubt the druggist frequently has occasion to protect the careless writer of prescriptions; but ignorance, inaccuracy, intentional omission, or unauthorized change of prescription, may be unpardonably criminal.

Our only safety is in sending our prescriptions to those druggists whom we have found to be thoroughly competent and trustworthy, and in a careful examination of the medicines after they have been prepared.

Yours truly,

FORDYCE BARKER.

MADISON AVENUE, No. 20, 1872.

We fear Dr. B. has been made the victim of a practical joke in the startling disclosures of the ex-drug clerk, and though he is not credulous enough to believe in detail, he is still satisfied that the instance referred to "is not entirely exceptional." In a ton of error there must needs be some grains of truth, and as great results often flow from trivial beginnings, in directions altogether unsuspected, we may yet have occasion to rejoice that the humble ex-pounder of drugs caused every nerve and fibre of the worthy Professor's organism to thrill with the righteous indignation, so evident in his note to the *Record*.

The charge of omission of expensive drugs, for the sake of profit, is on its face too absurd for the belief of any who study the actuating motives of human kind. Admitting, for sake of illustration, that selfishness is the ruling passion, setting aside all conscientious considerations, we are still led to observe the improbability of a course which the lowest degree of intelligence would pronounce a most suicidal policy. Every druggist is aware how much his success is dependent upon his reputation for accuracy, and it is unreasonable to assume that he will fail in the requirement of all others the easiest to fulfil. In this case the *policy* of *honesty* is too clear to be neglected.

Out of regard for the reputation of Dr. B. as an accurate observer, we must conclude that these recent cases are *sui generis*, else in his long career as a physician he must ere this have detected that which he now promulgates as a startling discovery. We do not think apothecaries would have occasion to regret the general imitation by practitioners of the practice of Dr. B. subjecting to the ordeal of critical scrutiny the medicines dispensed upon their prescripiions; neither can we doubt that in almost every instance the dispenser's accuracy would pass unchallenged. The plan certainly has some commendable features, and its general adoption might lead to some unlooked for, but nevertheless, valuable results, as it would prove a means of communicating to prescribers some useful information on the subject of incompatibilities, solubilities, etc., which they persistently demonstrate to the satiation of the dispenser of medicines. It would, of course, fail to reveal many an example of incongruity, and the dispenser would (if so profoundly ignorant of chemical affinities), continue to be at the mercy of directions to "rub well together" Tannin and chlorate of potassa, or to become a victim to the pyrotechnical display upon blending chromic acid and alcohol, or glycerin.

Seriously, the errors pointed out by Dr. B. are grevious ones, and their perpretators should receive the strongest censure. An inquiry into the occasion of these particular deficiencies would, probably, shoulder them not upon a dishonest purpose, but upon ignorance, which always fails in the due appreciation of responsibilities. But gross incompetency is scarcely less reprehensible, indeed is even more dangerous, than dishonesty united with proficiency, and no one will dispute the wisdom of Dr. B. in avoiding, or causing others to avoid, such pit-falls as he has described.

The examples seem to show the need of a wider dissemination of pharmaceutical science among the followers of the art. The opportunities for acquiring such knowledge have been greatly multiplied of late years, so that in almost every section of the country there are to be found Pharmaceutical Colleges. The better class of druggists' assistants avail themselves of these advantages, and there is, consequently, a gradual but steady increase in the proficieney and reliability of dispensers. To make any reform general and complete, resort must be had to the authority of of the law, and this is notably true in the particular department under discussion. Let us have pharmacy laws, the sooner the better, restricting the dispensing of medicines to properly authorized parties, and the demand for thoroughly qualified clerks would be followed by an ample supply. It may be said that New York City is within the jurisdiction of such laws at this moment, and yet from this very source comes the present complaint. True, legislation as adopted in several States does not look to immediate reform; a more radical course would have totally failed of its object. It is the part of wisdom to look to the good of coming generations, and it is upon those who are to follow that the greater benefits will fall. Each of us, if disposed, can exert some influence in reference to Pharmaceutical legislation, and an opportunity may soon be afforded in our own city, as we understand that the draft of the law adopted by the druggists of Chicago some two years ago, will be brought before the legislature at the present term. It should be enacted. It is the duty of every one having the welfare of pharmaceutical science at heart, to individually exert his energies in the proper direction, and lay the foundation for a lasting progress.

ADULTERATIONS.

"While it is very difficult, and perhaps almost impossible, to detect the finer kinds of adulterations in the case of liquors, we are fortunately able to follow the adulterator of the ordinary articles of food, and to detect his practice with certainty. Add perfectly odorless spirit to brandy, and although the adulteration is notable and profitable, it is beyond the reach of the chemist. Add chicory to coffee, and although the chemist fails to point it out with certainty, the microscopist is not so easily balked. Before his searching power the secret operations of the adulterator becomes as obvious as if performed in full view; for the microscope reveals to us the ultimate structure of the different vegetable and animal substances, and as each has its own well-marked characteristics, it is easily recognized by the expert as are the faces of his friends by an ordinary observer. No one who has ever seen potato-starch could readily mistake it for anything else; chicory and coffee are so unlike that the difference is instantly perceived, and the smallest addition of either one to a sample of the other is readily detected. So too in regard to many sophistications of a purely chemical character. Red lead added to vermillion is easily separated. Sugar when adulterated with sand may easily be made to give positive evidence of the presence of the latter. The coloring matter employed for the purpose of converting worthless tea-leaves into the best green tea, may without difficulty be identified, and the mineral matter, such as *terra alba* or farinaceous substances, such as wheat, corn, or potato-starch, used for the purpose of increasing the bulk and weight of confectionery, may be determined. There is a wide range of cases in which adulterations may be detected with ease and proved with certainty. Some of the tricks of the wily adulterator show marvelous ingenuity. Thus some persons, knowing that most ground coffee is adulterated, never buy the ground article, but always procure the whole beans, which they either grind themselves or get ground. To meet this case, the adulterator makes up a paste of ground chicory, pea flour, and other cheap materials, and moulds it, by machinery, into the forms of the beans. These artificial beans are rolled in a barrel until smooth, roasted to the proper color, and mixed with a small proportion of genuine beans, to give them the true coffee flavor. The fraud is of course easily detected, as such beans quickly fall to powder when soaked in water; but this example shows the ingenuity and painstaking of the fraudulent classes, who often spend, in efforts to cheat, an amount of labor and ingenuity that, if devoted to some honest undertaking, would be certain to insure success.

"How many children are robbed of their due amount of nutriment by the vile practice of watering milk! How often is the physician disappointed in the effects of the medicines that he prescribes, simply from the fact that these medicines are not pure. Some dishonest and avaricious druggist having adulterated them with cheaper and less potent materials, in order that the might make a little gain. Any attempts to suppress the practice of adulterations must be based upon certainty of exposure and punishment; and the practice of adulteration will probably never be completely and permanently checked until the government takes the matter fairly in hand, enacts efficient laws looking to the detection and punishment of this crime."

The above editorial, in reference to the value of the microscope in detecting adulterations, is from our worthy contemporary *Good Health*, and it gives us great pleasure to know that microscopists are alive to duty, and making good use of their "magnifyers" in exposing the rascalities of adulterators of food or medicines. We sincerely hope that the day may not be far distant when we shall have appointed properly qualified analysts whose duty it shall be to protect the public from these human vultures who prey upon the health, life and happiness of the human race. It certainly is the professional duty of the pharmacist, in his capacity as a semi-official guardian of the health and welfare of the public, to make known any adulteration that may come under his observation. The professional as well as the secular press is always at his command, and he has no excuse if he neglects to perform the duty he owes his fellow-man. We have found of great use a *blank book*, serving the double purpose of a record and scrap book, wherein we record all observations and items of interest pertaining to the profession as they are brought to our notice. This enables us to refresh our memory, and communicate the same when it may be of value, or is of interest to the profession. We would recommend this plan to our brethren, knowing that its adoption would produce the desirable result of more numerous and valuable contributions to the pages of our pharmacal journals, which are at present suffering for want of this very material.

Speaking of adulterations, we may mention the following, lately noted in the Chicago market: an article purporting to be neatsfoot oil was a mixture of kerosene or petroleum and neatsfoot oil, in the proportion of one part of kerosene to three of oil. It had the advantage of not congealing at a low temperature, and without doubt added a little extra gain to the coffers of an unscrupulous house. Several months ago we received from an Eastern manufacturing house four ounces of nitrate of silver in sticks; these were wrapped in unusually heavy paper, with an extraordinary amount of sealing wax attached for the purpose of sealing the ends. The nitrate of silver, when detatched from the paper and wax, showed a loss of 64 grains to the four ounces. Is this a fair mercantile transaction? 'Is it proper to pay for paper and wax at the rate of $1.05 to $1.10 per ounce? While speaking of these *little frauds*, we will mention the observations lately made by one of our colleagues, and communicated at one of the meetings of the College of Pharmacy. In emptying a five-gallon can of castor oil, scraps of tin were found soldered to the bottom of the can, which when removed, weighed six ounces. This is an easy mode of getting rid of the troublesome scraps of tin and iron, at the same time adding to the weight of the can, the tare of which is calculated by an average weight generally adopted. Short weight is also general in canned articles of food. Cans of fruit are sold for 2 lbs., when in reality, the can and contents together weigh but 24 ounces. How one pound and a-half of contents and four ounces of tin can make up two pounds, is one of the mysteries of trade we cannot explain. We have been informed by those who have charge of the weekly Pharmacal Meetings of the College, that the subject of adulterations is to receive special attention at these gatherings, and we hope to hear of many exposures through this source.

—A. E. E.

As before announced, this issue of THE PHARMACIST, introducing Volume VI., appears enlarged from 24 to 32 pages, exclusive of advertisements. By the use of "solid type" we are enabled to condense within its covers an amount of matter equal to that of many journals of double the number of pages.

☞ The subscription price is now $1.50 per annum, in advance, *postage prepaid by publishers.*

We enclose bills with this issue to all who are indebted to us, or who have failed to renew their subscriptions for the ensuing year. The sum from each is small, but the aggregate amount is a very considerable sum, which would be most acceptable to the publishing committee. We would urge upon all the importance of early remittances.

BOOK NOTICES.

We are just in receipt of the Report of the twentieth annual meeting of the American Pharmaceutical Association, held in Cleveland, September, 1872. It comes to us a little in advance of its usual appearance, a fact which, under the circumstances of its issue, indicates the degree of energy manifested in its editorial supervision. The volume reaches us this year shorn of its greatest attraction, namely, the annual report on the progress of pharmacy, which was not in readiness for the press. In other respects the report maintains its interesting character. The more valuable of the special and volunteer reports we shall reprint for the benefit of our readers. The typography of the volume is particularly excellent, and reflects great credit upon the publishers.

The Pharmacopœia of the United States of America, Fifth Decennial Revision. Published by J. B. Lippincott & Co., Philadelphia. 384 pp. Price $1-75 in cloth, and $2.00 in leather. For sale by Messrs. Jansen, McClurg & Co., 121 and 122 State Street, Chicago.

This long expected authority has just come to hand, and we will notice the same more fully in our next number.

THE PHARMACIST

AND

CHEMICAL RECORD.

VOL. VI. CHICAGO, FEBRUARY, 1873. NO. 2.

NOTE ON ALOES.

BY EDWARD R. SQUIBB, M.D.

A pretty close examination and cross-examination of the aloes of the commercial market, during the past few years, has led the writer to the inference that the differences in it are due quite as much to difference in mode of preparation as to difference in species, climate, &c. Comparing the varieties of the market with the uses and effects of the drug, without too much dependence upon the books, it will be found that there are two distinct classes.

Between these classes there seems to be a pretty sharp line of difference, while the individuals of each class shade off into each other without any well-marked boundary line. The prominent, and perhaps characteristic difference between the two classes of the drug is, that in their therapeutic effect one is comparatively mild and gentle, and unirritating, with tonic and aromatic qualities, while the other is more harsh and drastic, producing more irritation, and much more liable to overaction. This difference adapts the individuals of the first class better to use in human beings, and renders a selection for the mildest among the individuals very desirable, if not necessary, in the delicate organization of women, in the treatment of whose diseases this drug is so important and so valuable. The individuals of the second class are better adapted to the medication of animals, and by right should not be used for mankind.

Carrying this therapeutic distinction into the drug market, and applying it closely, the two classes will be easily made out by a marked difference in the sensible properties. The one class is of a lighter color, generally soft, and often semi-fluid in consistence, and varying in both color and consistence with length of exposure to the air, and with temperature. The odor is entirely different both in quality and degree, being aromatic in quality and feeble in degree. When strong, and approaching to the character of a stench, as it not unfrequently does, this may arise from decomposing animal matter, such as goat-skin, fragments of which are often found in the aloes. From the appearance of these fragments of skin, and fragments of the aloe plants, and from the presence of uncoagulated albumen, it seems almost certain that the individuals of this class have not been subjected to artificial heating, but that the exuded juice is dried in the sun,—perhaps in goat-skins, which line a shallow excavation made in the sand at the stump of the plant, whose leaves may have been cut off near the ground and laid with their exuding, cut ends over the goat-skin.

The second or more drastic class affords equal evidence of being prepared by artificial heat, and the depth of color to some extent indicates the amount and quality of the heat used. Most, but not all, the varieties of this class give evidence of being made by decoction of the plant, rather than by evaporation of juices obtained by exudation from the fresh plant.

All the individuals of the first class are known in the market as Socotrine aloes, or occasionally as East India aloes. While the second class has no generic or class name, but embraces the individual varieties which come from the West India islands, and from Eastern and Southern Africa. This group is well represented by the commercial titles Barbadoes aloes, Cape aloes, &c. And each of the two names mentioned covers, in the market, sub-varieties produced neither in Barbadoes nor in the Cape of Good Hope.

While some of the finer varieties of this class are occasionally met with which are very aromatic and very nice, giving evidence of careful preparation, this is so rare an exception that it does not modify the judgment of the writer to the effect that the whole class should be excluded from the materia medica and pharmacy which is specially applicable to mankind, and be confined to the larger uses of veterinary practice where it has special and very important advantages over the other class.

The so-called Socotrine aloes varies quite as much, though all under one name, as the other class with its various names, but of late years there is a growing tendency in the market to separate it into two subvarieties by difference in color, so that it is now not uncommon to hear of Red Socotrine aloes, and Yellow Socotrine aloes, the red variety being justly held in the highest estimation. A curious observation often verified by the writer is that the red variety is always yellow at first, and gradually changes to red through intermediate shades, by age and exposure to the air: and that continued exposure tends constantly to deepen the red color into garnet at first, and finally into reddish-black, when the edges are no longer translucent. The yellow subvariety, however, does not become red by age and air contact, but only deepens, as it dries and becomes brittle, into a yellowish liver color, or yellowish-brown, with very little of the red tinge, or none at all. This yellow subvariety it is in which the fetid, stinking odor is occasionally met with, and as both subvarieties are of the same yellow color at one early stage, even of their drug market career, and at this stage distinguishable chiefly by odor and visible impurities, the question arises as to whether both are not from the same source, and the same process of preparation, the parcels which become red being well and carefully prepared, while the parcels which do not become red, may, from containing putrescible matter, undergo a fermentation which may destroy the elements upon which the red color depends, and other more valuable qualities, as the aroma, &c.

The fetid odor of this subvariety is always diminished by age, and is altogether lost in the powder made from it.

As a general rule this Socotrine aloes is much higher in price than any of the grades of aloes by decoction, and loses much more largely by drying. All except the finer parcels of the red variety require to be melted, diluted, and strained before they are fit for medical use, and the loss by straining varies very much, say from 5 to 10 per cent. It is curious to notice how small a proportion of these impurities is visible by inspection of the aloes beforehand. The average loss from straining and drying is perhaps 15 to 18 per cent., but has, in the writer's experience, once reached 27 per cent. upon a large lot. The substances separated by straining through a sieve of sixty meshes to the linear inch, are chiefly pieces of goat-skin, shreds of the aloe plant, sticks, small stones, and hair. A specimen of these strainings is presented herewith. Exceptionably entire goat-skins are found in the parcels, and one is here shown tied up at the openings, showing how the juice is transported to the packing places. One outlet—the neck—appears to have been left open, as in the transportation of grape-juice from the wine-presses, through which to pour out the contents. After being emptied—for it was found empty—this skin appears to have been dropped into the package of aloes, possibly by some child, as the skin is smaller than others which have been met with. From another parcel a rude knife of very peculiar shape and construction was strained. This knife, as shown, was probably used to cut off or incise the leaves of the plant, though it does not appear to be particularly well adapted to such purpose for civilized hands. The above figures are given from an experience of straining, drying, and powdering more than twenty-two thousand pounds of Socotrine aloes.

The melting, straining, and drying of the aloes by artificial heat is very injurious to it, of course, as in proportion to the want of skill and care with which this is done, it degrades the aloes to the character of the lower grades made by decoction. But when the question is reduced down to a choice between this injury done and the common practice of drying on steam tables without straining, and thus powdering up goat-skin, stones, sticks, &c., there can be no doubt as to which course is best for the interests of medicine. The finer packages of Red Socotrine aloes, which always command a high price but are slow sale, contain so little of impurity which can be separated by a No. 60 sieve, that as a rule it is better to use it without this hurtful process. Spread thinly out upon shallow trays of tinned iron, the advisability of straining can be approximately and usefully judged. And if this be done in cold weather when the aloes does not run, and when the air is comparatively dry, a couple of months' exposure, at ordinary temperatures, is sufficient to dry the aloes well, retaining its natural aroma to a highly desirable and useful extent. It is very much to be feared that the use of such aloes in the officinal formulas is very much undervalued, since the Socotrine aloes which has passed through the writer's hands within the past ten years has been very nearly all used by successive crops of quack pill men, who must have good drugs while getting up the reputation of their nostrums, though this may not be the time when the money is made. Pharmacists, as a class, use very few such drugs, because not knowing their value they will not pay the price.

A case of very good Red Socotrine aloes imported by the writer from Messrs. Arthur S. Hill & Son, of London, is shown herewith, and will be found in the exhibition-room of the Association during the meeting. The members are invited to make a critical examination of it. This case cost £19 10s. per cwt. of 112 lbs. in London. That is to say, about 83 cents gold without freight, duty, or any other element of cost. The currency cost price to the writer cannot be far from $1.20 per pound. It is drier than usual, though not cleaner than the best of its kind, and will not lose in drying more than about 10 per cent., while it does not need straining. Add 10 per cent. to $1.20, and the cost will stand about $1.32 currency. A very high price, but the cost well represented in intrinsic value.

This case, however, is exceptionably costly, since five cases had by the writer from Messrs. Dix and Morris, of New York, next previous to this shipment, were of nearly as good quality, and quite as clean though not quite so dry, at 75 cents per pound currency.—*Proceedings of the American Pharmaceutical Association.*

ON OIL OF ERIGERON.

BY EUGENE J. WEEKS, JACKSON, MICH.

QUERY 15.—What is the best test of purity for Oleum Erigerontis Canadensis, and what oils are used to adulterate it?

It is generally conceded that there is no one test by which the absolute purity of any volatile oil can be determined. The writer is therefore obliged to step beyond the limitation of the query by giving a plurality of tests to establish the identity of the oil in question.

Nine samples under examination, obtained promiscuously from different wholesale houses in the country, furnished but four strictly pure oils. The adulterated oils differed very materially in appearance from the pure, possessing a very dark red color in distinction to the pale straw color of the pure commercial oil, and being quite viscid instead of a limpid fluid.

The adulterant found in each of the impure oils was fixed oil. Should alchohol be suspected, the most available test would be the acetate of potassa test recommended by J. M. Maisch, Proceedings American Pharmaceutical Association, 1858, page 355.

In case of an adulteration with non-oxygenated oils, the nitroprusside of copper test of Heppe, noted in the same article would be recommended. The writer, however, failed to obtain any indication of the presence of any of these adulterants, and therefore gives the reaction with the most prominent tests for fixed oils alone.

1st. Pure oil of erigeron, when dropped upon fine white filtering-paper, leaves only a very faint yellow stain at the expiration of three hours: whereas, all of the samples of impure oil give a very dark greasy stain under the same circumstances.

2d. Liquor potassæ, when agitated with an equal volume of the pure oil, and then allowed to stand a few hours, separates into two clear layers, imparting to the oil a red color. But when the impure oils are subjected to the same test they form a partial emulsion or saponaceous mixture, which settles ultimately into three layers, the intermediate one containing the fixed oil combined with the alkali.

3d. Officinal nitric acid mixed with an equal volume of pure oil upon a watchglass at first unites to a uniform brown-colored mixture, possessing the peculiar odor of fresh-cut hay, which at the expiration of twelve hours concretes upon the outer edge a dark brown resinous substance surrounding the clear limpid fluid in the centre, covered with a thin white film. When an impure oil is subjected to this test the mixture formed is of a black color devoid of the peculiar hay odor, and concretes to a black substance surrounding the fluid portion, which is covered with a brown film.

4th. Officinal sulphuric acid, when mixed with an equal volume of oil of erigeron, in all cases forms a black mixture immediately. The impure oil solidifies completely at the expiration of twelve hours, while the pure oil concretes only upon the outer edge in the same length of time.—*Ibid.*

ON THE PRODUCTION OF MILK SUGAR IN THE UNITED STATES.

BY JOSEPH L. LEMBERGER, OF LEBANON, PA.

QUERY 12.—Has any attention been given to the preparation of Milk Sugar (Lactin) in the cheese districts of the United States? Can the production be made remunerative?

In prosecuting my inquiries on this subject, I find more or less difference of opinion, and have settled down to the fact, that the manufacture of milk sugar cannot be made remunerative in the United States.

I know of no place in this country where milk sugar is now manufactured, but am informed that attempts have been frequently made and were found not to pay. From an analysis of milk taken from a communication by C. W. Street, Esq., who has charge of a cheese factory at

Elizabeth Farms, Lancaster Co., Pa., I find the following given composition of 1000 parts:

Water,	873.
Butter	30.
Casein,	48.2
Milk Sugar,	43.9
Phosphate of Lime,	2.31
Magnesia,	.42
Iron,	.47
Chloride of Potassium,	1.04
Sodium and Soda,	.66
	1000.00

No two analyses of milk correspond exactly, from the fact doubtless that the article is very readily affected by the fodder with which the cows are fed, as well as by temperature of atmosphere, &c.

The above analysis is given with a view of showing the proportion of milk sugar, and to inform the Association that in separating the casein in cheese-making, 15 parts of the 43.9 of milk sugar go with it into cheese.

Manufacturers turn the whey into the stable, and find it more profitable as an article of nutriment for their stock, especially for calves, than it would be were it concentrated, crystallized, and purified as lactin.

So long, therefore, as the manufacturers of cheese can get good prices for the calves they raise on milk whey, it is not likely that the production of milk sugar can be made remunerative.—*Ibid.*

ON SOME IMPURITIES IN THE COMMERCIAL RHIZOME OF CYPRIPEDIUM.

BY JOHN M. MAISCH.

Read at the Pharmaceutical Meeting, held Dec. 17th.

In a paper read before the pharmaceutical meeting, held in April last, I called attention to the fact that two different rhizomes are met with in commerce under the name of cypripedium or ladies' slipper. Through the kindness of several readers of the American Journal of Pharmacy, I was subsequently enabled to convince myself that the two plants furnishing the commercial article are *Cypripedium pubescens*, Willd. and *C. parviflorum* Salisb., of the rhizomes of which I gave a short description. I then stated that the rhizomes and rootlets of these two species are the only ones constituting the commercial article, with which I have had but a limited acquaintance and experience, and the commercial specimens obtained several years ago for my cabinet prove the correctness of my observation.

Recently, however, Mr. G. L. Truckenmiller, a student of this college, directed my attention to an admixture with the rhizome of *Hydrastis canadensis*, Lin., which he had observed in commercial cypripedium, stating that an herbalist of this city had informed him that it was almost impossible to collect the latter free from the former, since the two plants grew together in the same localities, and their interwoven rootlets rendered the separation of the two rhizomes extremely difficult.

The two species of cypripedium prefer bogs and marshes, but are said to be also found in rich low woodlands, in localities in which hydrastis grows. I have observed this latter plant to be pretty frequent in some localities in the mountains of the northeastern section of Schuylkill County, Pa., but did not find any cypripedium there, and it seems to me as if hydrastis could hardly grow in swamps, where the other plants probably thrive best.

However this may be, it is a fact that occasionally, at least, cypripedium is mixed with a considerable proportion of hydrastis, which may escape detection on superficial examination, particularly if *Cypripedium parviflorum* has been principally collected, the color of the rhizome of which is a brownish grey, resembling the yellowish grey of the corky layer on hydrastis, while the rhizome of *Cypripedium pubescens* has a blackish brown color externally. There is, however, no difficulty in distinguishing the admixture by its growth, as well as by its structure and color internally. *Cypripedium parviflorum* has the cup-shaped scars of the overground stems directly upon and above the rhizome, which is hollowed out considerably and bent zigzag up and down; hydrastis has an oblique rhizome, with very distinct nodes, and bears the stem scars upon short but distinct branches, of which only the older ones have concave or cup-shaped terminations. It breaks with a short fracture, exhibiting a resinous lustre and a reddish to a brownish yellow color in which the eight to twelve almost linear light yellow ligneous rays are distinctly visible, enclosing an orange yellow pith. The rhizomes of both species of cypripedium break likewise short, parviflorum usually circular, pubescens often nearly two-edged upon the fracture, which has little lustre, is white, almost mealy in appearance, and, with the scattered bundles of ligneous tissue, very indistinct. The rootlets exhibit a similar difference, those of hydrastis being bright yellow, with a central ligneous cord of a quadrangular or triangular shape.

In another specimen of ladies' slipper root, some senega and roots of other dycotyledonous plants, nor further determined, were observed.

It appears from the foregoing that the pharmacist must exercise care in selecting ladies' slipper root for medicinal use, lest it may be contaminated with other medicinal and non-medicinal roots to such an extent that garbling may be too tedious and expensive an operation.—*Amer. Jour. of Pharmacy.*

COW'S MILK AND THE BEST METHOD OF DETECTING ITS ADULTERATIONS.

BY CHARLES EKIN, F.C.S.

The physical properties of cow's milk are too well known to need description. It is a slightly alkaline liquid, and has a specific gravity varying from 1026 to 1031; according to the most recent analysis, it contains in a hundred parts,

Water	87.55
Fat	3.07
Casein	4.04
Milk Sugar	4.63
Ash	.71
	100.00

Milk has all the essential constituents of food-stuffs, viz., proteids, fats, amyloids and minerals in exactly the proper proportions to form a typically perfect food. These, measured by their carbon and nitrogen percentages, give 6.8 parts per hundred of the former to 0.7 of the latter. The phosphate of lime in milk is especially important to the process of the formation of bone, and this combined with the easy digestibility of milk, and as we have seen, by its containing in proper proportions all the essential constituents of a perfect food, explains why it should and does form the diet, *par excellence*, for the infant stages of life. It would seem a work of supererogation in these days of advanced knowledge to point this out; and, indeed nature has been teaching the lesson from time immemorial; but I have frequently heard mothers boast that their children had been brought up entirely without milk, whether human milk which is better, or its substitute from the cow, and that my experience cannot be altogether singular is sufficiently proved by the number of so-called infants' foods which we see everywhere advertised.

Although for adults the mixing of foods which long experience has justified is no doubt the best, still it is quite possible under certain conditions to live on a milk diet alone; and we have here at all events one instance where theory and practice are perfectly in accord. I have been assured by one whose authority is undoubted, and who has lived several years amongst certain tribes of Arabs remarkable for their fine physique and great strength, that they have but one meal a day, and that that meal consists entirely of camels' milk. The meal, it is true, must be rather a tedious affair, for owing to the stomach not being able to accommodate a sufficient quantity of the fluid at one time, they have to wait whilst they slowly pass the bowl from one to the other, until the casein has been coagulated in the stomach, and there is literally room for another draught. I am not informed whether this process is facilitated, as is reported of children at school feasts, by "standing up."

The white and almost opaque appearance of milk is an optical illusion; examined by the microscope it will be seen to be a perfectly transparent fluid, in which float numbers of transparent globules of fat. These globules are surrounded by an albuminous envelope, and the mechanical breaking of this, as in churning, causes the fat to agglomerate and become what is known to us as butter.

In the process of churning, a portion of the cheesy matter or casein of the milk becomes mixed with the butter, but this can be removed to a great extent by repeated washings in water, and decanting off the particles of casein which are suspended in it.

In the best kinds of butter the cheesy matter rarely amounts to more than one per cent.; in the inferior kinds there is often several per cent. present. As a rule, the more the casein is left in the butter, owing to its liability to putrefactive changes, the more likely the butter is to become rancid.

We have been treated of late years to several sensational articles in the newspapers as to the adulteration of butter, but they have no foundation in fact. The adulterants are almost invariably water and common salt. Good honest butter, if fresh, contains 82 or 83 per cent. of fat, about 1 per cent. of salt; and 16 per cent. of water; if salted, it should never contain more than 7 per cent. of salt. It is sometimes adulterated with as much as 35 per cent. of water. The fat should be estimated by washing with ether and evaporating down the ethereal solution. Where much water is present a rough estimate may be formed by melting the butter at a gentle heat in a graduated tube, and measuring off the proportion of water, which will of course sink to the bottom.

Cheese is made by coagulating the casein of milk; in this country by means of rennet, in other countries by such diverse substances as hydrochloric acid, vinegar, tartaric acid, sour milk, the juice of figs or thistles, etc. etc.; but though the manufacture of cheese offers many points of interest to the chemist, a discussion of them here would be foreign to the purpose of this article.

The cow stands first amongst all animals as a milk giver, both on account of the quantity and quality she yields.

The quality of the milk is much influenced by the age, the breed, the food, and the general conditions under which the animal is kept; and it becomes a point of importance to the analyst to know the extreme limits of this variation.

It used to be the custom to speak as to the purity and goodness of milk from the size and number of the fat globules as revealed by the microscope, but it is needless to say such a test is very unreliable, as is also the test of specific gravity. With regard to this latter test, it is evident that the removal of all or part of the cream, which is lighter than water, would increase the specific gravity, and a milk thus treated would actually in this way be pronounced better than it was before it was deprived of its cream.

Within the last two years, thanks to Mr. Wanklyn, who during that time has made several hundred analyses of milk, the results of which analyses he has published from time to time in the 'Milk Journal' and elsewhere, the assay of milk has been put upon an altogether more satisfactory footing than it has ever been before. Mr. Wanklyn has based his conclusions upon the amount of total solids milk contains; and although this mthod is not of his originating, it has been brought in his hands to a completeness and degree of accuracy which leaves little to be desired.

In examining a milk according to his plan, small thin platinum dishes containing carefully weighed quantities of milk are to be maintained at a temperature of 212° F. by means of a water bath for three hours. The residue once dried is not found to be very hygroscopic. This, of course, gives the total solids. If it is desirable to estimate the ash as well, the precaution must be taken (to avoid overlooking chloride of sodium, which is slightly volatile) to ignite the residue for as short a time ass possible and weigh the ash, then ignite very strongly until the ash is completely whitened, and reweigh.

Four examples of genuine milk treated thus gave per cent. :—

Total solids dried at 212° F.	Ash.
12.12	0.61
12.16	0.63
12.51	0.66
12.47	0.76

Genuine milk of average richness, and neither skimmed nor watered, contains approximately 12 per cent. of solids, and gives about 10 per cent. of cream. Milk which has been skimmed, but not otherwise maltreated, contains about 10 per cent. of solids. From the departure from these standards we can judge of the extent to which skimming and watering have been practised, the removal of 1 per cent. of cream lowering the solids of milk by 0.2 per cent.

Analyses extending throughout a whole year were made of the mixed milk of fifteen cows, and they show that the milk scarcely ever varies. In but four instances did the water fall below 86.6, and in four only did it rise above 88 per cent.

In making a complete analysis of milk, the water is found by deducting the weight of solids.

The fat, by treating the total solids with ether, and evaporating down the ethereal solution.

The milk sugar is dissolved by water out of the milk residue which has been deprived of its fat and moistened with alcohol. The aqueous solution of milk sugar is evaporated in the water bath and dried until constant in weight. The weight of the salts dissolved out of the milk residue by water is ascertained by igniting the dry residue containing the milk-sugar and is deducted; the difference giving of course the milk-sugar.

The casein, coagulated in the usual way and separated by filtration, being on a filter cannot be accurately weighed, and may be found as difference.

Notwithstanding the statements to be met with in works treating of the Adulteration of Food, as to sheep's brains, etc., etc., being occasionally added to milk, water is really the only adulterant that is ever met with. There can be no doubt that in large towns the practice of watering exists to a large extent. In London, especially, according to the 'Milk Journal,' the samples of pure unskimmed milk form only a small minority.

Mr. Wanklyn has lately suggested that his method of limited oxidation by means of a strongly alkaline solution of permanganate of potash may be very well applied to the examination of milk, casein yielding 6.5 per cent. and albumen 10 per cent. of ammonia. I am not aware that he has published any experiments bearing upon this, but those who have had experience in the estimation of albuminoid matters in potable waters according to his plan, will readily understand that it may be adapted with great advantage to the examination of milk.

Pharm. Journal and Transactions, London.

[⁂ In a letter received from Mr. J. F. Brown, of Dover, in reference to the testing of milk, he suggests that a determination of the amount of sugar present might form the basis of a convenient and trustworthy test. He says, "I remember applying it some years ago, by first separating the casein by heating with 1 per cent. of acetate acid, then diluting the whey to a definite measure and dropping it from a burette into a measured quantity of the solution of cupric potassio-tartrate, kept boiling in a flask until the color was discharged. This copper solution was made from the directions in Attfield's Chemistry, so that 100 grains was equivalent to 5 grains of lactose."]—*Ed. Pharm. Jour.*

CONVERSION OF THE SULPHATES OF THE ALKALIES INTO THE CARBONATES, TARTRATES, ETC., IN THE MOIST WAY.

BY J. LAWRENCE SMITH, LOUISVILLE, KY.

Having had occasion more than once to convert small quantities of the sulphates of the alkalies into carbonates, I have for several years employed a process that has been found both certain and convenient; in some recent investigations it has been used, and as it has never been described, it may not be unimportant to explain the nature of the process and its results. The agent used to produce the conversion is carbonate of baryta, made by precipitation; where precise results are required, the carbonate should be prepared by carbonate of ammonia. The manner of producing the decomposition is as follows: Dissolve the sulphate of potash in water, using about twenty or thirty grammes of water to every gramme of the sulphate, and saturate the solution with carbonic acid by passing a current of carbonic acid into it; or, what is better, dissolve in the beginning the sulphate in water already saturated with carbonic acid; now add to this solution precipitated carbonate of baryta, in the proportion of about one and a half of the carbonate to one part of the sulphate. It is always best in adding the carbonate to rub it up in a mortar with a little water so as to form a thick cream, for by so doing it mixes well in the solution.

This operation is performed in a bottle that can be well corked with a cork or gum stopper; now agitate the bottle frequently, or, what is still better, attach it to a piece of machinery that will agitate the bottle.

Many laboratories have such, and it is a very useful one in many experiments. In a longer or shorter space of time, the decomposition will be completed, pour the solution into a capsule and heat to the boiling point; the solution will then contain only carbonate of potash.

The reaction is readily understood: the carbonic acid in the water dissolves a little carbonate of baryta, which is immediately reprecipitated in the form of sulphate, carrying down a portion of the sulphuric acid of the soluble sulphate, and replacing the same with carbonic acid; this is rapidly repeated through the agency of the free carbonic acid until the decomposition of the sulphate is complete.

Among many experimental results I will give the following: Five grammes of the sulphate of potash dissolved in carbonic acid water, to which was added seven grammes of precipitated carbonate of baryta, after four and a half hours shaking (being attached to a suitable piece of machinery), on testing showed not a trace of sulphuric acid, care being taken to wipe the neck of the bottle near the end of the stopper before pouring out the liquid.

Other experiments, varying in proportion, gave similar results. I tried to substitute the natural for the precipitated carbonate of baryta, but with very unsatisfactory results.

Directions for the Conversion of the Alkaline Sulphates into Tartrates, Oxalates, etc.—As the tartrate and oxalate of baryta are but very slightly soluble in water, we cannot form the alkaline salts of these acids by direct double decomposition of the sulphates of the alkalies and the tartrate, etc., of baryta, as in forming the alkaline chlorides from the sulphates, but it is easily done by the following indirect process:

Add to the alkaline sulphates in solution in a porcelain capsule, carbonate of baryta rubbed up into a thick cream, in the proportion of about five of the sulphate to seven of the carbonate of baryta; heat the mass and add little by little the requisite quantity of tartaric or oxalic acid; solution of the baryta and precipitation of the sulphuric acid take place rapidly, and the decomposition is soon completed.

I have used this process of forming the bitartrates in the process of separating potassium, rubidium, and cæsium, that were in the form of sulphates.

The carbonates of the alkalies can also be formed by first forming these organic salts from the sulphates, evaporating the solution to dryness, and burning the residue; in fact, I frequently find it more convenient to convert the sulphates of the alkalies into their carbonates by this last instead of the first process. And, finally, I would remark that where magnesia is present with the sulphates, this is also separated from the alkalies.—*Amer. Chemist.*

CEMENTS.

A good rubber cement may be prepared by dissolving one part india-rubber in two parts linseed oil, and adding to the solution a sufficient quantity of bole, say about three parts.

For amber and tortoiseshell, a cement is made by mixing together equal parts of mastic and linseed oil, and warming gently. This cement should be used warm.

To unite wood to wood a thick solution of shellac in alcohol may be used. It is well to put a piece of fine gauze or crape between the broken surfaces of wood, and then press them tightly together until the cement becomes perfectly firm. Another good, durable cement for woodwork is made by fusing together shellac, mastic and common turpentine, and adding some broken isinglass.

For attaching small objects to anything turned, a mixture of colophonium, turpentine and yellow wax, with the addition of a little pulverized sealing wax, answers nicely. The cement sets quickly and holds well.

To fasten knives and forks in silver handles, a mixture of 2 parts of melted black pitch and 1 part of fine brick dust may be used. It must be used warm.

A varnish or cement to protect wood from the action of mineral acids, alkalies and corrosive gases, like chlorine, is made from 6 parts of colophonium and 3 parts of wood tar by heating together in an iron kettle on a furnace in the open air, and then stirring in 4 parts of fine brick dust. The varnish is applied with a brush while warm.

An excellent cement for glass is made by dissolving 1 part india-rubber in 60 parts of choloroform, then adding 34 of mastic, and letting it digest for a week at a gentle heat. This cement is also applied with a brush, and is especially distinguished by its transparency.

Another cement for glass and porcelain is made by digesting small pieces of isinglass in 16 times their weight of water for 24 hours. The solution is evaporated to one-half, strained, and, while still hot, 8 parts of alcohol added, and at the same time a solution of 1 part mastic in 6 parts warm alcohol. One-half part of finely-powdered gum ammoniac is triturated in the warm solution until the whole mass is homogeneous. When used, both the cement and the object to be mended are warmed. This cement is highly recommended for its adhesive qualities.

GLUE AND GUM CEMENTS.

These are very tender and adapted to mending ornaments. They resist the action of water and atmosphere. There are various kinds of these cements for bone, ivory, whalebone, mother-of-pearl and precious stones.

One of these is made by dissolving 2 parts isinglass and 4 parts colorless glue in 60 parts water, evaporating to half its volume, then adding 1-15 parts mastic dissolved in 1 part alcohol, and stirring in 2 parts zinc white. The surfaces are warmed when the cement is applied to them. This cement holds well, dries easily, and may be kept a long time in tightly-corked bottles.

For bone, ivory, whalebone, mother-of-pearl, etc., a cement with a beautiful gloss may be prepared as follows: Soak common cabinet-makers' glue in hot water, warm the jelly formed, add enough pulverulent slaked lime to give it consistency. Warm the object to be cemented, clean the surfaces carefully, apply the cement and tie the parts firmly together. In a few days it gets very hard. Even common glue, with pulverized chalk stirred in, makes an excellent cement for wood and metals.

For fastening leather to metal, the metal should be coated with a hot solution of glue, and the leather with a hot extract of nut-galls. Allow them to dry quietly, and they adhere well.

For porcelain, the well-known white-of-egg cement is best. To prepare this, it is only necessary to stir the white of eggs into quite a stiff solution of glue, and then apply to the fracture.

A cement of gum for porcelain is made by pulverizing 4 parts of oyster shells and mixing intimately with 2 parts pulverized gum arabic. The powder is kept in a well-stoppered bottle, and when needed for use is rubbed up with white of egg, or warm water, to a thick dough, applied to the object and dried by a gentle heat. Another cement for glass and porcelain is made from 8 parts well-burnt pulverized alabaster gypsum and 2 parts fine gum arabic, mixed with water to a thick paste, and 40 to 50 drops of oil of turpentine added to an ounce of the cement.

CEMENTS FROM CASEIN.

For glass, porcelain, stone and wood, the very best cement is made of a suitable quantity of old cheese rubbed fine and mixed with water to a thick magma, and a fourth part of pulverized lime added.

A still stronger cement for the same purpose is made by slaking 1 pound of quicklime in water, and mixing with 3/4 pound pulverized lime or sandstone and 1 pound pulverized cheese. Before using, it is well to moisten the fracture or edges with warm water.

A so-called casein waterglass is made as follows:—The casein of skimmed milk is separated from it by the addition of acetic acid, filtered, and the acid washed out with water. The pure casein thus obtained is mixed with six times its volume of concentrated waterglass. This cement is thoroughly commendable, and well repays the trouble taken to make it.

An excellent cement for artificial meerschaum, and one that may be used to give consistence to silk goods or to coat artificial flowers and court plaster, to give more adhesiveness and firmness, is made by rubbing two to four parts of the above casein with cold borax solution till a thick liquid is obtained that becomes clear on standing. This also renders goods waterproof.

WATERGLASS CEMENTS.

For glass, earthenware, porcelain, and all kinds of stoneware, these cements are excellent. A cement for glass and marble is prepared by rubbing together one part of fine pulverized glass and two parts of pulverized fluorspar, and then adding enough waterglass solution to give it the consistency necessary in a cement.

Waterglass mixed with hydraulic cement to a thick dough makes a good cement for the edges and joints of stone and marble slabs. It is well to mix but little at a time as it hardens very quickly.

LIME, GYPSUM, CLAY AND CEMENT, MIXED WITH WATER, OIL OR BLOOD.

For cementing stone and for filling crevices in buildings, before they are painted, the masons use a cement made of fresh blood, slaked lime, brick dust, broken up coal ashes, hammerslag and sand in all proportions. This excellent cement hardens quickly, and offers great resistance to the action of the weather.

A lime cement for connecting water pipes, bathing tubs, etc.; a mixture of two-thirds fine brick dust, two-thirds unslaked lime, and two-thirds hammerslag, is made and stirred up with lye or hot oil to a stiff dough.

Another cement intended to render Hessian clay retorts impenetrable, is obtained by rubbing freshly slaked lime into a concentrated solution of borax. The solution is applied with a stiff brush and allowed to dry, after which it is heated until the glazing begins to fuse.

Clay mixed with water and fresh warm blood, containing some unslaked lime, is used in Germany to close joints in stoves. The cement is applied while the stove is hot. Wood ashes, fire clay and salt mixed with water is used for the same purpose. Fat and burnt clay, in equal proportions, moulded with water into a dough, is also used.

Plaster of paris mixed with water and a cold solution of alum is an excellent cement for stoneware. It sets slowly, but becomes as hard as stone.

IRON CEMENTS.

Their essential constituents are iron filings or borings. By the addition of some common salt or sal-ammoniac they are rapidly oxidized, and the cement being thereby increased in volume completely fills the crevices where it is put. An excellent luting or cement for the joints and crevices in iron surfaces, and for rendering tight cast-iron steam and water pipes and water tanks is made of filings of cast iron. The filings are sifted to obtain those of the size of a grain of rice, and then rubbed with horse urine and one-half part salt ammoniac, well worked together, and an equal quantity of flowers of sulphur added. The mass is hammered until it gets warm, and then cold, and, finally, it begins to be brittle. In this condition it is put in the joints, and soon hardens. The surfaces where it is applied must be free from rust. Greasy and oily substances are most readily removed by rubbing with cotton dipped in benzine. The cement keeps best under water.

Another good iron cement is made by stirring 5 parts clay, 1 part salt, and 15 parts iron filings together with vinegar to a magma. It will stand heat, and is used for bellows and air pipes.

OIL CEMENTS.

An excellent oil cement for porcelain and for luting of retorts, flasks and porcelain evaporating dishes is obtained when ordinary brick dust is powdered, sifted and mixed with an equal quantity of red lead, and then rubbed, under great pressure, into old boiled linseed oil to a thick paste, which is mixed with coarse sand to the stiffness of cement. When a dish is to be covered with it, paste is applied before the sand is put in, and the sand then strewn upon it. The dish is afterwards exposed to a steady heat for a long time.

For larger vessels take 6 parts litharge, 4 parts fresh-burnt pulverized lime and 2 parts white bole, and mix with cold linseed oil.

To fasten metallic letters to a smooth surface a cement is made as follows:—30 parts copal varnish, 10 parts linseed oil varnish, 6 parts crude oil of turpentine, 10 parts glue dissolved in a little warm water, and 20 parts pulverulent slaked lime. It is very pliant and soon hardens.

To unite copper and sandstone take 3½ parts white lead, 3 parts litharge, 3 parts bole, 2 parts broken glass, and rub up with two parts linseed oil varnish.

As a polish for gravestones, basins, etc., a paint is made of 9 parts of finely sifted and burnt brick clay and 1 part litharge, mixed with a sufficient quantity of linseed oil.

For connecting cast-iron water pipes, twelve parts Roman cement, 4 parts white lead, 1 part litharge, and ½ part colophonium are pulverized and mixed; from 2½ to 3 pounds of it is triturated with old linseed oil, in which is boiled 2 ounces of colophonium.

Another for the same purpose is made of equal parts of burnt lime, Roman cement, potters' clay and clay, separately well dried, finely ground, sifted, well mixed and triturated with linseed oil. Common lead lute for stopping openings in apparatus is best made from litharge and red lead mixed with old boiled oil. In all cases the surfaces must be clean. They stand well under water.

As lead lutings are somewhat expensive, the following is recommended:—Take 2 parts red lead, 5 parts white lead, and 5 parts of the finest clay, and mix with boiled linseed oil.

A good oil cement for wood, especially for antique carvings, is made of 1 part pulverized slaked lime and 2 parts rye flour, mixed with linseed oil varnish. It takes any desired color and polish.

To make water holders tight we may use pulverized slaked lime and cod liver oil.

A cement to make chemical apparatus tight can be prepared from oil cake or pressed almond cake rubbed with water.

MISCELLANEOUS CEMENTS, ETC.

Furniture polish:—Moisten 120 parts beeswax with oil of turpentine, and add 7.5 parts finely pulverized resin, and enough aniline red to give the desired mahogany color.

Oil cement:—100 parts red lead, 250 parts white lead, 200 parts pipe clay: mixed with boiled oil.

Water cement:—100 parts slaked lime, 190 parts brick dust, 160 parts sand, 50 parts blacksmiths' dross, 50 parts powdered lime; mix with water.

Another:—600 parts iron filings, 100 parts ignited sand, 100 parts powdered slaked lime; mix with water

Iron and blood cement:—100 parts pulverized lime, triturated with bullock's blood, 290 parts cement, and from 5 to 10 parts iron filings.—*Journal of Applied Chemistry.*

CONTRIBUTIONS TO CHEMICAL TECHNOLOGY IN 1872.

BY PROFESSOR CHARLES A. JOY.

The year 1872 is not distinguished by any great and important discovery, but it has contributed its fair share toward increasing our knowledge of what has gone before. It may be well to pass in review some of the most important contributions to applied science that have been recently recorded.

PHOTOGRAPHY.

In photography there has prevailed extraordinary industry, and the number of new methods and suggestive pieces of apparatus of which record has been made during the past year is unusually great. The Woodburytype, which has had to encounter much opposition, is gradually winning its way to public favor. For certain classes of work it is preferred to photolithography and carbon printing. The Albertype has received certain modifications and improvements at the hands of Ernst Edwards, and is now justly regarded as one of the most perfect processes for preserving in unfading inks either portraits or copies of works of art. The details of this invention have been given to our readers at various times during the past few years. For porcelain pictures a sensitized film can be prepared as follows:

Rain water 200 grams, dextrine 10 grams, grape sugar 12 grams, bichromate of ammonia 15 grams. The substances should be dissolved in the above order. The ammonia salt is preferred to the potassium bichromate. The plates ought to be held in a horizontal position for some time and must be dry and warm. Better expose in diffused light for 10 or 15 minutes. The colors to be burnt in should be well mixed with flux, so as to melt hastily and impart a fine gloss to the picture.

Sensitized paper has become an article of commerce, and its keeping quality depends upon certain details of preparation that have been worked out in this country and Europe.

Mr. Carey Lea recommends the following bath for sensitizing the paper: 24 grams of crystallized nitrate of silver, 1 gram tartaric acid, 192 grams water. The silver nitrate and tartaric acid are each separately dissolved, mixed and filtered after a few hours. If to 129 grams of the bath one gram gelatine and 12 drops of glycerine be added, the paper retains its flexibilty for a longer time than under ordinary circumstances. Paper thus prepared can be kept in the dark for two or three months. Collodion paper as a substitute for gun cotton has been prepared in large quantities. It is said to dissolve readily and to afford a solution that flows easily, and that works up well. The passage of the fiber of cellulose through the process of paper-making is known to be favorable to its subsequent conversion into pyroxiline, just as precipitated cellulose makes the best gun-cotton. Photographs upon cloth, colored with fuchsine, have been prepared which did not change in acids and chlorine. The developer employed was sulphate of copper.

The proposition to produce carbon pictures upon plaster and clay, in such a way that they can be electrotyped and printed from the same, as stereotype plates, is one of the most ingenious of the photographic exploits of the year. Something similar was attempted by Woodbury from thin gelatine films, but I have never heard of any practical use being made of the invention. If we can transfer a carbon print to plaster and thus eventually obtain a raised surface for holding the ink, it will enable us to add an important feature to our methods of illustrating books.

COAL TAR COLORS.

We have of late years become familiar with aniline and the colors derived from it, and very little has recently been added to our stock of knowledge of this branch of the subject, but during the past year another coal tar product called anthracene has attracted much notice, as from it has been prepared alizarine equal to the best Turkey red. I gave a somewhat extended account of artificial alizarine in the December number of this journal, and need not in this place go into details on the subject. The preparation of alizarine from anthracene must be regarded as one of the most valuable technical contributions of the past year, and if the coming year should prove that we can obtain anthracene from asphaltum and native pitch, the discovery of a method for making artificial alizarine will prove of great importance to agriculture, as it will restore to cereal crops many thousand acres of land now devoted to the culture of the madder root, and thus the starving poor of Europe will profit by researches which, at the time they were made, were looked upon as of a purely scientific character.

CARBOLIC ACID.

It cannot be claimed for carbolic acid that it belongs to the past year. It was discovered many years ago, but its value for many purposes in the arts was not fairly demonstrated until recently. It now enters into a great variety of medicinal preparations, is employed in the tanning of leather, for the destruction of insects, and as an invaluable antiseptic. Its presence in well water, situated near a gas factory, was detected by Landolt in Aix la Chapelle by the employment of bromine water, which, in an extremely dilute solution of carbolic acid, gives rise to a yellowish white, floculent precipitate, so difficultly soluble as to make its appearance in large volumes of liquid. Carbolic acid has attained so much importance that during the year a large octavo volume has been written on the subject. Another compound found among the products of tar is xylol, which was supposed to afford an excellent remedy for small-pox. It created considerable attention at one time, but has not obtained the importance of carbolic acid.

FURNACE SLAGS.

The so-called waste products have long been a great annoyance to chemists, and the repeated attacks made upon them by industrious workers have greatly diminished their number, and converted them into substances of so much value that the indirect residues are sometimes worth more than the products directly sought. The unsightly mountains of cinders and slags to be seen about blast furnaces are fast diminishing in Belgium and Germany, and we find that many proprietors are able to sell the slags at remunerating rates, and are thus relieved of what was formerly a great burden. The slags are ground into cement, granulated for road beds, converted into alum, consumed in glass making, cast into blocks for heating and building purposes, and thus in a great variety of ways are economized and prevented from accumulating, as they formerly did, to the great annoyance and cost of manufacturers.

One of the most interesting features of the forthcoming Vienna Exhibition promises to be the display of products formerly wasted. These are to constitute a group by themselves for the purpose of comparison and study. Among the most important reclamations recently accomplished, and which are likely to form a part of this curious show, may be mentioned the following:

The refined use of housekeeping materials which were formerly thrown away; the manufacture of sulphur and valuable composts out of the waste gypsum of the soda-water factory; the injurious and poisonous gases of metallurgical works, such as sulphurous acid, arsenic, zinc vapors, hydrofluoric acid, now turned to good account; a valuable oil made from cotton seed; a fat obtained from the lees of soap; woolen rags turned to account the same as linen and cotton refuse; distillers' wash made the source of potash; blood changed to albumen; cork refuse for floor cloths; horse shoe nails and scrap iron for the fabrication of the soft iron of English fowling pieces; saw-dust for oxalic acid; leather scraps for Prussian blue. In fact, this is a very imperfect list of the articles which can be shown as owing their origin to substances that were formerly thrown away.

NICKEL PLATING.

The protection of iron by means of nickel is one of the most beautiful appliances of electro metallurgy that has been accomplished in recent times. The hardness of the metal and its extreme durability make it preferable to silver for many purposes. The proposition recently made to protect type by nickel facings bids fair to give a new direction to the uses of the metal.

THE RECOVERY OF TIN.

The recovery of tin from clippings appears to be nearer a practical solution than it was a year ago. There would appear to be no doubt that the methods proposed are perfectly practicable, and the chief difficulty is to secure the faith of tin workers that it is worth while to save their scraps. It is high time that the enormous waste of a metal so valuable as tin should cease.

CHLORINE GAS.

Deacon's process for converting the hydrochloric acid of the soda ash manufactory directly into chlorine and water, by passing the acid vapors over bricks saturated with salts of copper, has been more thoroughly tested during the past year, and bids fair to afford a method for the continuous and economical preparation of chlorine that may supersede all others. It was thought at one time that Wealdon's plan of regenerating the chloride of manganese and reconverting it into the oxide of manganese would accomplish a most important saving in the consumption of the black oxide, and if Deacon's process does not prove sufficiently economical, the plan of Wealdon would no doubt be adopted as the next best in the market. Considerable progress has been made in the preparation of this important chemical product.

NEW BLEACHING AGENTS.

The latest bleaching agents that have been proposed are permanganate of potash and ozone. It is a question of economy in both instances. The permanganate of potash is one of the most important agents for bleaching and disinfecting that has thus far been found. It has been tried on paper stock, and bleaches that material most thoroughly, and it is maintained that, in the matter of expense, it compares favorably with chloride of lime. As a disinfectant, the permanganate is growing in favor also, and meets with extensive use in hospitals. It is natural to refer to ozone in the same connection, as one of the methods of preparing it is from the permanganate of potash.

We find ozone recommended for a variety of purposes, and various forms of apparatus have been invented to facilitate its production, but notwithstanding the labor and research that has been bestowed upon it for many years, we still want an economical and ready means for its production. In our note of progress, however, we must not neglect to mention the fact that more ozone is used for technical purposes at the present time than in years past, and there is every prospect of a steady increase in the future.

FERMENTATION AND BEER.

Pasteur has contributed an important modification to the usual brewing process, the salient point of which consists in excluding the air from the wort during the operation of fermentation. English authorities report that the flavor of the beer is hardly equal to that which is produced in the old fashioned way, but as what is called flavor is an acquired taste, it does not follow that in a short time Pasteur's beer may not become the favorite of a younger generation of drinkers. It is interesting to see in this invention a practical application of the exhaustive research of Pasteur on the germ theory of fermentation and the action of air upon wines and fermentescible substances. What at first appeared to be a purely theoretical investigation after all turns out to have practical applications, and the transition from theory to practice has in this case been more rapid than usual.

OXYGEN AND HYDROGEN.

The cheap production of oxygen and hydrogen is a problem that has not yet been fully solved. The time does not appear to have arrived for an increased use of these gases in metallurgy or the arts, and hence, although several of the methods proposed for their production would doubtless, on a large scale, yield favorable results, there has not been sufficient demand to entice capitalists to invest in any of them. The hydro-oxygen illumination has been pronounced impracticable in France and Belgium, save for signal or experimental purposes. The danger, cost and want of diffusion in the light have led gas engineers to report unfavorably.

That oxygen and hydrogen should not be employed on a vast scale in all metallurgic operations is one of the mysteries which a scientific man is unable to solve. The ease with which most ores could be reduced, the perfect control over the furnace heat afforded by the use of gases and the cleanliness of all operations would appear to commend gas furnaces to all metal workers; the obstacle in this, as in many similar cases, is not so much in the difficulty of finding a practical way for making the gases as in overcoming the ignorance and prejudice of those who control capital. If diffusion of knowledge followed the same law as the diffusion of gases, we should soon arrive at triumphant success. The Siemens furnace and the Bessemer process are the natural growth of investigation upon the properties of gases, and they are of sufficient importance to gratify the most ambitious advocate of scientific progress.

NITROGEN FROM THE AIR.

To employ the nitrogen of the atmosphere in various chemical processes has long been the aim of scientific men. The result may be said to have been attained in the production of cyanogen compounds, but it is only recently that we have succeeded in obtaining ammonia by synthesis from the air. The tendency of nitrogen to combine with titanium has long since been observed in iron blast furnaces, and the formation of salamanders due to this tendency has been the occasion of much mischief and pecuniary loss, but it was only recently that du Motay proposed to make some practical use of the experience gained through so many years. By passing air over titanium ores, du Motay found that the nitrogen readily combined with the titanium, and by subsequently conducting steam over the nitride of titanium ammonia was copiously evolved.

The second part of the reaction can be represented by the formula:

$$N_2Ti_3+6HO=2NH_3+3TiO_2.$$

BROMINE.

The bromine industry has changed its base since the opening of the Stassfurt mines, and it appears probable that all the bromine required for commercial purposes will henceforth be derived from this source. The methods of working up the mother liquors have been modified and improved, and the article can be offered at a greatly reduced rate, the only difficulty being that the supply far exceeds the demand.

IODINE.

The same observations can be made of iodine, which occurs in such large quantities in the nitrate of soda beds of South America that this source of supply bids fair to supersede all others. The ingenious use of the sulphites and of sulphurous acid to precipitate the iodine from the mother liquors of the Chili saltpetre works has greatly facilitated operations and accomplished a large saving in the production of iodine.

FLUORINE.

We have made little progress in our knowledge of the element fluorine, but the efforts to economize the hydrofluoric and silico-fluoride vapors of metallurgical works have met with considerable success. If the beet sugar industry should ever attain large proportions in the United States, we should have to encounter the same questions that have embarrassed European producers, namely, a ready way for economizing the potash of the uncrystallizable syrup. It has been proposed to precipitate this potash by means of hydrofluosilicic acid, and hence the importance of obtaining the acid in sufficiently large quantity and at remunerative rates.

SULPHUR.

The production of sulphur from pyrites meets with increasing favor, and I am glad to be able to report that this industry is spreading in the United States. It is high time that we should make our own sulphuric acid by the application of superior skill and the use of our immense resources. The auriferous pyrites of Colorado, the copper pyrites of Lake Superior, the nickeliferous pyrites of Pennsylvania, the iron pyrites of almost everywhere, would seem to hold out sufficient inducement for the investment of capital in works where, by saving the sulphur and converting it into sulphuric acid, ores very poor in metals could be economically worked. Oil of vitriol has long since been called one of the engines of civilization. It is an oil which lubricates many an art and sustains vast industries, and upon its cheap production depend too many interests to admit of our sparing any effort to have its manufacture firmly established in America.

SILICON.

Silicon, like oxygen, is so abundantly distributed that it is impossible to escape it, and yet its compounds need considerable more elucidation than chemists have hitherto been able to bestow upon them. The past year has, however, witnessed a material progress in our knowledge of silica, and in the practical applications growing out of this information. The Ransome artificial stone is based upon a refined study of the properties of soluble silica, and improved agricultural methods appear likely to follow upon Friedel and Crafts' investigation into the organic compounds of silex. The growth of our knowledge of this element has been a silent one, but none the less sure, and we may anticipate important developments in the early future.

MANGANESE.

There appears to be dawning upon us the possibility of reducing manganese on a metallurgical scale from its ores. It is somewhat remarkable that a metal which possesses such peculiar and valuable properties should have so long resisted the attacks that have been made upon it. We really know very little about it, and it is only recently that its reduction from its ores has been accomplished in any quantity. It is generally stated in the books that it is necessary to keep metallic manganese either hermetically sealed or enclosed in naptha. If we had never seen iron in larger fragments than a hazel nut we should be apt to come to the same conclusion.

It was only when iron was worked by the ton that we learned to know its properties. When we have manganese in equal quantities we may discover that it can also be safely left outdoors if protected by paint, and we shall doubtless find its alloys of great value in the arts.

The above are a few of the contributions to chemical technology developed or perfected during the year 1872.—*Jour. of Applied Chem.*

SUPPOSITORY MOULDS OF PLASTER PARIS.

BY CHARLES E DWIGHT.

Pharmacists who have had many suppositories to make with the old moulds have undoubtedly often hurt their fingers by pounding in trying to remove the suppositories. I have been for some time using a mould which parts through the centre and is made of plaster Paris, which gives so much satisfaction that I can but wish for others to try it; it may have been used by others, but is entirely original with myself.

The expense of buying moulds of metal which part through the center has probably been detrimental to their universal use, while they are undoubtedly superior to those old finger smashers in being easily cleaned and oiled, and also facilitating the extraction of the suppositories when cold. For the benefit of those unused to the manipulation with plaster, I will give a general plan for preparing the moulds.

Into a vessel of about six inches long by two wide and one deep, (a pasteboard box will do,) pour in plaster mixed to the consistency of thick cream, until half full; have ready six suppositories, moulded of wax, from other moulds of good shape, and while the plaster is yet soft immerse them to half their diameter, with their large end close to the edge of the box, all in a row and a uniform distance apart. When the plaster has set, gently remove the wax, and with a knife smooth off the surface and trim the edges of each mould sharp, and between each depression made by the wax suppository dig a small cavity about the size and shape of a small pea cut through the centre. Now we have half of our mould. When the face has become hard, oil or grease with linseed oil or lard, replace the wax suppositories and raise the edges of the box by wrapping heavy paper around, which will extend about another inch above the surface of the face; mix another portion of the plaster equal to the first, and in the same way, and gently pour over the greased surface until it will be about one inch deep above the other or lower half. When hard, the two parts can be easily pulled apart, the edges trimmed off and each part boiled for about an hour in linseed oil, which will prevent the adhesion of the substance to be moulded. The plaster must be mixed thin *and well stirred* to be substantial.

By following the above plan almost any number of sizes can be made at small expense, and will, I think, be found to answer admirably. If this will in any way alleviate the frown which comes over the face of the pharmacist when he finds he has to make suppositories, the object of the writer will be fully attained.—*Amer. Jour. of Pharmacy.*

DETECTION OF ADULTERATION OF SOAP.

BY F. JEAN.*

There are found in many soaps, large proportions of foreign matters, such as starch, (most soft soaps contain some of it) talc, ochres, clay, sulphates of the alkaline earths, etc.; which are fraudulently added to give weight to the soap. These matters are very easily separated. It is only necessary to dissolve the soap in alcohol at 40°. All the foreign substances, a part of the chloride of sodium, the sulphate and carbonate of soda, are thus separated. One of the frauds, which is now becoming very common, is the introduction of very concentrated silicate of soda, in hard soaps, (sometimes 17 per cent.) The silicate of soda, being insoluble in alcohol, is easily separated. Then after dissolving it in water, by means of a dilute acid, the gelatinous silica is precipitated, or by boiling the solution with sal-ammoniac, the same is accomplished. It is precipitated in the form of the easily recognizable flake.

The determination of the excess of alkali, which it is often useful to make, is generally accomplished by treating the soap with alcohol. The carbonate of soda is separated by this means. But the free caustic alkali, being soluble in alcohol, escapes detection. I employ for the determination of the free caustic alkali, the following process. An alcoholic solution of the soap is made, and after having separated the insoluble matters, the solution is placed on a water-bath, and a current of carbonic acid gas is passed into it. All the alkali not in combination with the fatty substances, becomes a carbonate, and therefore, insoluble. By filtering the separated carbonate, the quantity of caustic alkali in the soap may be determined. In saponifying pure fatty acids, with different quantities of soda, I have obtained 12.3, 12.5, 12.9, 12.4, of alkali; as a mean 12.6, per cent. of soda. As it has been well demonstrated, that the soaps of fatty acids are true salts, knowing the quantity of combined alkali contained in a soap, it becomes easy to calculate the quantity of fatty acids, which corresponds to it. The analysis becomes, therefore, a very simple problem of alkalimetry. Two or three grammes of soap are dissolved in alcohol, at 40°, and without disturbing the insoluble matters, a current of carbonic acid is passed into the solution, then it is filtered. The precipitate is washed with alcohol, in order to remove the traces of soap. The alcoholic solution is diluted with water, and boiled in order to drive away the alcohol. 5-10 c. c. of sulphuric acid are then added, and the ebullition is continued until the fatty acids have become very limpid. After cooling and solidifying, the fatty acids are filtered off, and the precipitate and the fatty acids are washed with warm distilled water, until the washings are no longer acid. Then the excess of sulphuric acid is titered with a graduated solution of soda. The quantity of sulphuric acid saturated by the alkali of the soap is found by calculation, and, consequently, the quantity of alkali which corresponds to it. The quantity of alkali contained in 100 parts of the soap being known, it is only necessary to multiply by 100, and divide by 12.6, in order to find the weight of the anhydrous fatty acids, which it contains. The weight of the fatty acids, added to that of the alkali, and substracted from 100, gives the quantity of water, and of foreign substances, contained in the soap. This process of analysis is rapid and gives sufficiently accurate results to be used with advantage. It can not be used when the soaps contain resin. In the analysis of soaps made by the cold process, it is necessary before treating the soap with alcohol, to boil it in a saline water, in order to dissolve the different salts of soda, with organic acids, which the soap may contain; because these salts, not being decomposed by a current of carbonic acid, comport themselves like alkalies combined with fatty acids.

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* Conclusion of a paper on the Analysis of Soap, published in the *Moniteur Scientifique* and translated in the *American Chemist*, Nov. 1872.

Some soaps often contain large quantities of water in excess; those for instance made from cocoa-oil, contain fabulous amounts (100 of cocoa-oil can make 500 of soap.) It is therefore important to calculate the quantity of water which a soap may contain. Generally from 2 to 5 grammes of soap, cut into fine shreds, are dried, and the weight taken as soon as the pieces are reunited. When it is desired, to make an exact analysis, the operation is not so simple and the drying up a stove, is rarely complete, because the soap in drying swells up, and thus encloses a certain amount of water, and firmly holds it; if the temperature is raised too high, the risk is run of carbonizing a part of the soap. In order to determine the percentage of water in soaps, I employ the following process: I dissolve in a little weighed porcelain capsule one or two grammes of soap, cut in fine shreds, in the smallest possible quantity of strong alcohol. Then I add a known weight of fine well-dried sand, sufficient to absorb all the liquid, and it is heated in the bath at 110°. The drying is rapidly accomplished, and the siliceous powder finally treated with bisulphide of carbon, is used to determine the non-combined fatty matters.—*Canadian Phar. Jour.*

THE DIFFERENCE BETWEEN BENZOLE AND BENZINE.

So much confusion prevails, in consequence of the indiscriminate use of the words benzole and benzine, that it may be proper to state what these substances really are, and in what particulars they differ, and in what they are alike.

In the year 1825, Faraday discovered a peculiar liquid in the holders which at that time were used for conveying illuminating gas to private houses in London. He gave to it the name of bicarburet of hydrogen, and published a pretty full account of its properties. Nearly ten years afterwards, the Berlin chemist Mitscherlich produced the same substance from benzoic acid, and in allusion to its origin he proposed the name benzine. Liebig reprinted Mitscherlich's article in his "Annalen,' and in a foot note remarks that, as the termination *ine* is too suggestive of strychnine, quinine, etc., bodies with which it has no analogies, it would be better to change the word into benzole, and this he accordingly did.

It was thus that the word benzole was first introduced into our language. The French writers adhered to Mitscherlich's original name, and in their dictionaries we find the word benzine, while the English have adopted Liebig's proposition, and speak of benzole. We should have been spared much confusion if Faraday's original name had been retained by all parties.

It will thus be seen that, at the outset, benzine and benzole meant identically the same thing, but after the discovery of petroleum it was observed by chemists that the native rock oil was quite a different substance from the coal product of the gas house. The various hydrocarbons which can be distilled from petroleum have a different chemical composition, and vary in specific gravity and properties from the coal tar products. Benzole has a fixed molecular composition; it is a true chemical compound, as much so as alcohol or water; its properties have been fully studied and described, so that on this point no doubts need prevail. On the other hand, the volatile substances which come over during the fractional distillation of petroleum are of a mixed and indefinite character, and it is difficult for chemists to agree upon a definite specific gravity, boiling point, etc By degrees it has become customary in the United States to call the liquid which has the specific gravity of 62° to 65° Baume (=0.73) benzine; the lighter hydrocarbons are called naptha, rhigoline, and chymogene; the latter is condensed by pumps and is used for an ice machine. This class of liquids differ considerably from the true benzole of coal tar; the latter has a specific gravity of 0.85, and freezes at 37° Fah. The light oils of petroleum have never been frozen, and their specific gravity is very low; any product of the distillation of petroleum having so great a specific gravity as 0.85 (that of benzole) would be too thick to burn in a lamp and could only be used for lubricating purposes. The solvent properties of benzole and benzine are analogous, though by no means identical; benzole rapidly dissolves asphaltum while benzine scarcely attacks it; benzole is a better solvent of resins; benzole is far superior to benzine in carbureting air or gas for illuminating purposes. The most marked difference between the two exists in the fact that benzole can be converted by nitric acid into nitro-benzole, and by further treatment into aniline; whereas benzine from petroleum is not thus acted upon, and cannot be employed in the manufacture of aniline colors. Benzine can be readily ignited at a distance, while benzole must have the flame brought a little nearer; although it is volatile at all temperatures, and gives rise to explosive compounds. Benzole costs from six to eight times as much as benzine, according to the state of the market. Nearly all the benzole of the world is sent to Germany to be there manufactured into aniline, from which are subsequently made the favorite aniline colors. It will thus appear that although benzine and benzole started into life meaning one and the same thing, they have, in the course of time, come to be two widely different substances. Benzole is made from coal tar, benzoic acid, and numerous other bodies, and can be converted into aniline. Benzine comes from petroleum, is very light, cannot be frozen, and cannot be converted into aniline. We find from our foreign exchanges that the English, French and German writers are beginning to recognize this distinction, and it will be better for all parties to agree upon what boiling point, specific gravity, and chemical formula they will adopt for benzine. Benzole contains about 92.5 per cent. carbon, and 7.5 per cent. hydrogen; benzine is approximately composed of 84 per cent. carbon and 16 per cent. hydrogen. In America, therefore, benzole and benzine mean different bodies of different origin, and having different uses.—*Scientific American.*

EDITORIAL DEPARTMENT.

THE NEW PHARMACOPŒIA.

The long looked for revision of this national work reached us too late for an extended notice in our last issue; ere this it is, or at least should be, in the hands of every pharmacist, each having scrutinized the various alterations, additions, &c., with more or less critical comment. It is, therefore, needless for us to particularize the points of difference between the present Pharmacopœia and its immediate predecessor.

The most radical changes which we observe in the new revision, relate to the preparation of fluid extracts, and here we recognize the influence of Mr. Taylor, who at the meeting of the A. P. A. in this city, suggested the mode of manipulation which has now become officinal. While we hesitate to endorse such a general use of glycerin as a menstruum, we find embodied in this class of preparations the best and most satisfactory work of the committee.

To correctly estimate the value of the New Pharmacopœia, we must necessarily pay regard to the lengthened period of its preparation; so we reflect that nearly three years have elapsed since the meeting for its revision held council in Washington, and that accordingly we, and all, had been led to expect a work of corresponding magnitude or importance, as the result of the prolonged deliberations of the local committee. Had the work appeared two years ago, as it might well have done, we should not have experienced the disappointment which we are now obliged to acknowledge, in which avowal, we think we express the sentiments of nine-tenths of the pharmaceutical body. The work scarcely deserves the impress of "1870," much less of "1873," as it fails to reflect many new and valuable ideas communicated to the pharmaceutical journals during several years past. The "Conservatism" of the local committee, amounting almost to a dread of innovation in any form, has caused them to cling with remarkable pertinacity to the precedents of the past, and we can only understand this hesitation to modify and improve pharmaceutical processes and products, when we remember that the majority of the local committee represented the medical rather than the pharmaceutical profession.

CORRESPONDENCE.

MR. EDITOR:

In your last issue you speak of keeping a record or scrapbook for noting down the novelties that occur from time to time. Now I would ask you why you do not give us from time to time in the pages of the PHARMACIST such observations. They certainly would be of more interest to the trade at large than the long scientific papers that treat in theories and abstract sciences, and are not generally comprehended and certainly not appreciated by a majority of those who practice Pharmacy in this country. What the members of the trade want, and for which purpose they are willing to support a publication is for *practical information*, every day facts. I hope you will not make the same mistake that so many who have the management of journals fall heir to, that of filling the pages of their publications with matter that is of no interest and of less value to the every day practical man whose wants should not be neglected, as he is greatly in the majority in the community, and publishers are largely dependent on him for support. Many of us take a pride in holding up Pharmacy as one of the noble professions, when in reality in this country it is a trade and we are only *simple* shopkeepers. Now, Mr. Editor, after having been thus friendly disposed in pointing out the hidden reefs which have shipwrecked so many journals, I hope you will not think me presumptuous if I ask you for some information. Like yourself I keep a scrapbook, and I find noted down the following queries, What is Eau de Sedative? What is Theriack and what is its formula? What is Aqua-Rabellii? By answering you will oblige FAULT-FINDER.

Our first impulse on reading the above communication was to consign it to the waste basket; but on reflection we began to moralize, and remembering the old saying, "that it takes all kinds of people to make the world," we began somewhat to enjoy the criticism of Fault-finder, and wished him in our editorial position for a short space of time, when he would no doubt be effectually cured of requesting "practical information," every-day facts," etc., at the hands of editors. Where are we to get it from? This same "practical, every-day man," who, as our correspondent says, constitutes the *great majority* of the community, is continually "mum," and we meet with his name not more frequently in imparting practical information than that of our faultfinding correspondent. These men usually request information from others, but are slow in imparting any that they possess. We would say to him that we shall always hail with the greatest pleasure any communication that may prove of some use to the profession, whether it is of scientific or practical character, as the noble army of contributors to our pharmaceutical journals is very small, and original "copy" for the printer is very scarce. Regarding the question whether Pharmacy is a profession or a trade, we will not discuss, but simply say it is always best to look high!

Eau Sedative, is one of the numerous remedies of Raspail, a physician who lived in France during the early part of the present century, obtaining some notoriety in his native country as the founder of a domestic system of medicine, based upon the so-considered marvelous virtues of *Camphor*, an ingredient of all his formulæ, and no doubt regarded by him as the long sought for panacea "for all ills that flesh is heir to." He published several books which have become popular authorities in the treatment of diseases by the masses of the French people.

Eau Sedative is of three strengths, but generally the weaker is dispensed when not otherwise designated. Take of

Water of Ammonia	5 parts
Spirit of Camphor	1 part
Chloride of sodium	3 parts
Water	100 parts

Dissolve the salt in the water, let the impurities subside, and add the clear solution to the ammonia and camphor previously mixed by agitation in a bottle.

Eau Sedative, medium strength. Take of

Water of Ammonia	8 parts
Spirit of Camphor	1 part
Chloride of Sodium	3 parts
Water	100 parts

Mix.

Eau Sedative, strong.—Take of

Water of Ammonia	10 parts
Spirit of Camphor	1 part
Chloride of Sodium	6 parts
Water	100 parts

Mix.

Vinaigre Camphre, camphor vinegar. This is also frequently called for. Take of

Camphor in powder	1 part
Distilled Vinegar	32 parts

Mix.

Aqua Rabelii is the Acidum Halleri of the Pharm; Bor. Take of

Rectified Spirit	3 parts
Sulphuric Acid	1 part

Mix; Secundem Artem.

Electuarium Theriaca.—The confection of opium of the U. S. Pharm. may be substituted for this antiquated compound.

Enquirer Harrisburg, desires a formula for Tinctura Kino Compostia.

[We know of a compound powder but not a tincture. Can any of our readers give us a formula?—EDITOR.]

Mixture de Java.—Take of

Orange Flower Water	5 parts
Wine of Opium	3 parts
Alcohol	3 parts
Ether	1 part

Mix.

Student of the College of Pharmacy.—The published formula for *Oleum Baunscheidtii* is, as follows:

Cantharides, in powder	1 part
Euphorbium, in powder	2 parts
Olive Oil	40 parts

Digest the powder in the oil for several hours, with gentle heat, and filter.

[We have been in the habit of dispensing a mixture of equal parts of Croton and Olive Oil when wanted.—A. E. E.]

Liquor Nervinus is the *Spiritus Ætherus Camphoratus* of the Hamburg Pharmacopœia. Take of

Camphor	1 part
Ether	3 parts
Alcohol	9 parts

Mix.

Eau de Javelle.—This contains Hypochlorite of Potassa in Solution. The officinal Solution of Chlorinated Soda may be substituted for it.

CHICAGO COLLEGE OF PHARMACY.

The Annual meeting for the election of officers for the ensuing year, the reception of President's address, reports of committees, etc., and the discharge of the usual business, will be held at the College Rooms, No. 77 Dearborn Street, on Wednesday afternoon, March 5th, at 2 p. m. sharp.

The undersigned would urge upon every member of the College the necessity of attending this meeting. Important changes in the By-Laws have been proposed and will be acted on.

As the College now owns a valuable property in Scientific Apparatus and Library, the interests of all will be jeopardized by not attending at this time.

GEO. BUCK, *President.*

BOOKS RECEIVED.

Year Book of Pharmacy, comprising abstracts of papers relating to Pharmacy, Materia Medica and Chemistry, contributed to British and foreign Journals from July 1, 1871 to June 30, 1872. With the transactions of the British Pharmaceutical Conference at the ninth annual meeting, held at Brighton, Aug., 1872. London: Churchill & Sons.

The work before us is the most interesting of the annual reports thus far presented. We have already printed abstracts of the original papers presented to this meeting. The volume is issued under the editorial supervision of Mr. Wood and Prof. Attfield, a sufficient guarantee of its excellence.

The proceedings of the third annual meeting of the Vermont Pharmaceutical Association, held at Montpelier, Vt., Nov. 23d and 24th, 1872, have been received. This young society exhibits much life and vigor, enrolling some 52 members under its banner, who are residents of the "Green Mountain" State. The officers for 1872 and '73 are President, Frederick Dutcher, St. Albans; Vice Presidents, Elam C. Lewis, Rutland, and M. K. Paine, Windsor; Secretary, Albert W. Higgins, Rutland; Treasurer, Colins Blakeley, Montpelier.

OBITUARY.

DR. CASSELMANN.

We regret to learn of the demise of Dr. Arthur Casselman, of St. Petersburg, Russia. This is a great loss to the Pharmacal profession of Russia, of which he was one of the foremost co-laborers for its advancement. His investigations and publications have been numerous and of real value to the profession at large. He was yet in the prime of life, and when we last had the pleasure of meeting him at the Pharmacal congress at Paris we little thought that our friend endowed with so much vigor and health, would be taken away from us so soon. Dr. Casselmann was an honorary member of this College, also of the American Pharmaceutical Association, and many other scientific bodies throughout the civilized world.—A. E. E.

PROFESSOR DR. HERMANN LUDWIG,

Director of the Pharmaceutical Institute at Jena, editor of the Archive fur Pharmacie, Honorary member of the Chicago College of Pharmacy, and of the American Pharmaceutical Association, died on the 7th of January, 1873, aged 54 years. He was one of the foremost workers in raising the status of the profession, and his many valuable researches and contributions to Pharmacy have given him a world-wide reputation as an investigator and journalist; his loss will be severely felt by all who have the profession at heart.—A. E. E.

CINCINNATI COLLEGE OF PHARMACY.

At the regular annual meeting of the Cincinnati College of Pharmacy, held at their hall, Cincinnati, Jan. 13th, the following officers were elected for the ensuing year:

President—J F. Judge; *Recording Secretary*—F. L. Eaton—*Corresponding Secretary*—E. S. Wayne; *Treasurer*—W. H. Negley.

Trustees, for short term (holding over)—A. J. Tully, Paul Reinlein, Otto Taxis, John G. Fratz.

Trustees, for long term—S. M. Ayres, J. D. Wells, H. F. Renne, George Eger.

TO THE DRUGGISTS OF TENNESSEE.

GENTLEMEN:

At the request of a number of prominent Druggists in different parts of the State, and of the Trustees of the TENNESSEE COLLEGE OF PHARMACY, you are invited to assemble in Nashville on Wednesday, 14th of May, 1873, to take into consideration—

The best means to secure the enactment of laws regulating the Drug business of our State;

To encourage proper relations between Druggists, Pharmaceutists, Physicians, and the people at large, which shall promote the public welfare and tend to mutual strength and advantage;

To improve the science and art of Pharmacy, suppress empiricism, and to gradually restrict the dispensing of medicines to educated Pharmacists.

It is not necessary to speak of the importance of this move, as from our united action much can be accomplished to improve the science and art of Pharmacy, and to secure to the public greater security in the dispensing of medicines.

If unable to attend, please send your views on the above in full.

BENJ. LILLARD, *President*.

JOS. J. HALL, *Secretary*.

Nashville, February, 1873.

Half Fare can be secured to Nashville during the month of May to attend the Industrial Exposition.

The annual meeting of the Chicago College of Pharmacy takes place on Wednesday, March 5th. By reference to the notice of the President, it will be seen that business of great importance will be brought before the meeting. Every member should be present. In connection with the report of this meeting, we shall print in our next issue a list of the members of the College.

THE PHARMACIST

AND

CHEMICAL RECORD.

VOL. VI. CHICAGO, MARCH, 1873. No. 3.

THE MANUFACTURE OF PEPSIN.

BY R. ROTHER.

With the important discovery of Mr. E. Scheffer, of Louisville, Ky. a new era was developed in the manufacturing interests of pepsin. The multitude of uncertain and mostly worthless preparations, erroneously called pepsin, has been swept from the market by the bona fide article, which alone merits the title, and is in truth the coveted desideratum, pepsin. This real, active, definite and always reliable pepsin, is most abundantly easily and expeditiously obtained by the famous process of Mr. Scheffer which consists in precipitating it from its acidulated aqueous solution by saturation with chloride of sodium.

The history of pepsin will record an entire revolution through the agency of this simple method. The commercial interest will suffer a thorough change, as henceforth the exorbitant price of a comparatively worthless substance will be reduced to a very moderate rate, and then purchase a very superior article.

In the preparation of this substance, the pharmacist ordinarily imagines an exceedingly unpleasant operation.

But the sooner he disabuses his mind of this nauseous idea, the greater will be the advantage to him. The process, however, is mere pastime, when compared to many less dreaded duties that are comprised in the routine of pharmacy.

Pigs' stomachs are the best sources of pepsin, and the yield of such a peculiar principle, exerting such a vast digestive power, is comparatively enormous, if the proper means are employed to secure it. The first consideration which requires attention is, that the stomachs must be fresh. The contents are then immediately removed, and the stomachs well cleaned by a judicious use of fresh water, so as not to waste the mucous membrane in which the digestive principle seems to reside. The second step consists in cutting them into moderately thin shreds by means of scissors. This done, they are macerated for two days in a large volume of acidulated water—the more the better. However, one gallon of water, acidulated with half an ounce of muriatic acid, is ample for one stomach. At the end of this time the acid liquor is poured off, and the stomachs are again macerated for two days, with a similar quantity of acidulated water. This operation of macerating the stomachs can be performed three times with advantage, and even a fourth maceration will repay the effort. The liquids obtained from each maceration are immediately treated with about one-fourth their weight of common salt, and the precipitated pepsin, which accumulates in curdy flakes upon the surface of the liquid, is skimmed off with a ladle, collected on a muslin strainer and strongly pressed, to separate the most of the adhering water. The cake of yet moist pepsin is then mixed with a weighed quantity of milk sugar, the mixture spread out to dry, then weighed, and sufficient milk sugar added to make the final weight of the mixture equal to ten times the weight of the real pepsin contained in it, which is determined from the difference between the weight of the dried residue and the known quantity of milk sugar at first added. A source of error may, however, occur here, and the finished preparation be under strength, if the presence of a considerable quantity of chloride of sodium is not taken into account. The moist pepsin, after pressing, still retains over three times its weight of water, which can only be separated by evaporation, and as this water contains at least one-fourth of its weight of salt, the amount of this will perhaps equal half the weight of real pepsin present.

Therefore, the strength of the dried residue is best determined by means of an assay, and its final strength adjusted with the addition of milk sugar, so that ten grains of it shall at least dissolve 120 grains of coagulated albumin. In an extensive practice, with the necessary experience, this is not absolutely necessary, because the concentrated brine adhering to the pepsin can, in a great measure, be replaced by a much weaker saline solution, and afterwards pressed and dried. Most of the salty liquid can also be easily removed, by spreading the pressed pepsin upon abundant folds of bibulous paper, and allowing the liquid to be absorbed, and when quite dry mixing with the necessary amount of sugar of milk. Cold weather is the only proper season in which to undertake the manufacture of pepsin, as putrified material is not at all serviceable, and in warm weather it is nearly impossible to prevent rapid decomposition.

It will amply pay any pharmacist to make his own pepsin, if he has a sufficient demand for it, because the process is so simple and inexpensive, and the yield so plenty. The product in saccharated pepsin, procured from six stomachs, by means of four macerations, is as follows: First maceration, 16 ounces; second maceration, 12½ ounces; third maceration, 8 ounces; fourth maceration, 4 ounces; total, 40½ ounces. The average yield of six stomachs by two macerations, is 20 ounces, and where raw material is abundant, only two macerations are usually performed, since it is difficult ordinarily to continue the process unaccompanied by putrefactive tendency. Thus it will be seen that, aside from labor, very little outlay is incurred; that the remuneration for extracting pepsin from six stomachs is $20, at the regular wholesale rates.

Several attempts were made to place pepsin in a concentrated liquid form, having the same strength as the saccharated. For this purpose the moist pepsin with adhering salt was dried, and then mixed with sufficient muriatic acid and glycerin to make the liquid weigh ten times as much as the pepsin employed. This did not give satisfactory results. The moist pepsin was then treated at once with acid and glycerine, without being first dried, the strength being adjusted from the data of the usual loss in water that moist pepsin sustains. This mixture, after long standing, did not form a clear solution; it filtered slowly and with great difficulty, and the remarkable fact was ascertained that the filtrate would not dissolve coagulated albumin. But the unfiltered liquid showed an undiminished activity when diluted and tested with albumin. Through this result it was found that if the liquid, be it acidulated water or glycerin, is increased to forty times the weight of the pepsin, a perfect solution can be made, which possesses the required activity, only it is but one-fourth as strong as the saccharated powder. No trial was made whether a pepsin freer from salt would make a more concentrated and perfect solution. But even this weaker solution, containing 2½ per cent. of real pepsin,—equal to 25 per cent. of the saccharated—is perfectly stable, and for the purpose of making more dilute solutions of pepsin it is far preferable to the powdered.

An interesting fact connected with the pepsin question has just been ascertained by the writer. It is the villainous imposition perpetrated by a wilful charlatan, in a rascally enterprise of forcing his fraudulent concoctions upon the market. A preparation known as "Houghton's

Pulverized Pepsin," has caused much comment by its very marked bitter taste, and Mr. A. E. Ebert, of Chicago, expressed his opinion at the meeting of the American Pharmaceutical Association, held at Baltimore, Md., that the bitterness was due to strychnine, stating, however, that he did not succeed in proving its presence.

If the bichromate of potash and sulphuric acid test, which is so extremely delicate for pure strychnine, is applied to a mixture of strychnine containing sugar, the reaction is prevented or obscured by the reduction of the chromic acid to the sesquioxide state. But if the mixture contains uncombined strychnine, chloroform will extract it,—not though if the strychnine exists in the condition of a salt. The suspected pepsin was therefore treated with a few drops of ammonia, and then with chloroform, the mixture poured upon a filter, the filtrate evaporated, and the residue tested with sulphuric acid and bichromate of potash, the beautiful violet color was instantly and profusely manifested, thus giving indubitable evidence of the presence of strychnine. The vicious combination purporting to be pepsin, therefore owes its activity, such as it is, solely to a most virulent poison—strychnine! The inference of Mr. Ebert was therefore correct, that Houghton's pepsin owes its bitterness to the presence of strychnine.

ON ADULTERATION OF DRUGS.

BY J. H. SCHULZ.

A number of articles have lately appeared in the Pharmaceutical Journals referring to the important subject of adulteration in drugs and medicines.

It is generally admitted that the villainous practice of intentional adulteration and sophistication of medicines is, to a considerable extent, carried on in this country as well as abroad, and usually the guilty parties who thus deceive the incompetent or careless pharmacist, disappointing the confiding physician and endangering the lives of a trusting public, escape the just punishment their crime deserves.

The object of these unscrupulous adulterators and mixers is that of pecuniary gain, and the question arises, how can this evil be remedied, and what is the duty of the conscientious pharmacist to extirpate this tendency, ever growing among a class of dealers who have no higher motive than the gain of the "almighty dollar?" There is but one answer to this important question: it is, never to purchase a single article, at any price, that is not of a prime and good quality; and should at any time articles of poor quality be sent, to at once reject and refuse, under any consideration, to receive them. This is the only practical mode of improving the drug market, as trade interests always regulate themselves by the demand, and if there is no sale for such inferior goods, there will be no producers. The enactment of laws to control this species of frauds has proven useless; the remedy is in our own hands, and if we neglect to make use of the same, we are culpable as aiders, whereas it is our solemn duty toward suffering humanity to be the abators of this villainy. There is also another source of inferior drugs that is often overlooked by the members of the trade; it is the deterioration of remedies by *age*, especially those of a vegetable character, as roots, herbs, leaves, flowers, etc. The dispensing pharmacist should exercise great care in this respect; drugs should be properly stored in containers that are of such a character as to preserve the virtues for a proper length of time, and when this limit has been reached, is it not better to destroy and replace them with a reliable article, than to supply the physician or the suffering patient with a remedy that is partially or wholly inert? Does not the professional reputation of the pharmacist suffer by such neglect to do his duty toward his fellow men?

Not long since I received a quantity of so-called Fenugreek, which, on examination proved to be a mixture of ground oil cake, corn meal, and a small portion of Fenugreek—so that it was barely detectable. Gum opium, received from a New York house, contained, on an examination, twenty per cent. of sand. *Rye meal* was found as an ingredient, in large quantity, in powdered orris root; the same was true with powdered elm bark. A few weeks since I received a package of gum Benzoin, which, from appearance seemed artificially prepared. A sample I retained for examination, the balance, with the above mentioned articles, were returned to the senders. Ninety (90) grains of this suspected sample of gum Benzoin was treated with rectified spirits, and the residue when dried, yielded fifty-five (55) grains of what seemed to be hemlock bark.

WATERTOWN, Wis., February, 1873.

ESSAY ON ACONITES AND ACONITINE.*

BY CHAS. PATROUILLARD, FRANCE.

Description of Aconite Root.

Contrary to what has been observed in regard to the aerial parts of the plant, the root of Aconitum Napellus is constant in its form; it is a subterranian stem, or rather a rhizoma, fleshy, napiform, which, in the fresh state, gradually terminates in a point, sometimes, on the contrary, ending quite abruptly. Its length is very variable, the shortest being about 12 centimetres; it may acquire, in certain conditions of the soil, 25 centimetres (Bentley). Its greatest diameter, which is more than 2 centimetres and a half, is ordinarily reduced to 2 centimetres after desiccation. It is furnished with a great number of radicles, with bristling extremities, of a deep fawn color. These radicles, sometimes isolated, sometimes grouped together in twos and threes, seem to be scattered over the surface of the root without any order of arrangement. I have observed, however, in a great number of specimens, that they are disposed in vertical series. Of these series there are at least six, and as many as eight may be observed on the best developed roots.

At the side of this napiform root a second one, similar to it but smaller, is always found. It is united to the base of the first, separating from the main root at its free extremity. The base of the second root is surmounted with a shoot, as I have described in the preceding chapter. The color, externally, of this root is a clear yellow —or brownish, like that of coffee. The relative position of the two parts of the root is not always the same; the lateral piece is constantly placed a little higher than the main root, but sometimes it is very near the central stem, and sometimes, on the contrary, it diverges from it.

The fracture of the fresh root is clean, starchy, and of a pure white color; exposed to the air it rapidly assumes a red color, at least in the roots which have a full year's growth; for specimens younger than this suffer exposure without change of color.

M. O. Berg and M. Fluckiger (Pharmacognosie) have described the anatomy and the morphology of the fresh aconite root. The roots of commerce, collected at very different stages of the vegetation of the plant, do not present the same appearance. I proceed to describe such as I have observed.

*** Translated from the author's thesis. See editorial department.**

The exterior surface of the adult roots is almost smooth, very finely marked with an infinite number of very delicate ridges running parallel with its axis. On the contrary, in very young specimens, and in old ones, the root is deeply wrinkled in the direction of its length. Transverse grooves are never observed.

The color of the epidermis of the young roots is a clear yellow; it is more or less brown in the old, probably in consequence of changes undergone in the tannin which the latter contain in greater quantity in that part of their tissue.

At the base of the root is observed a cicatrix, more or less circular, indicating the insertion of the stem, and bearing on its margins the vestiges of the scales which surrounded the neck. On one of the sides of this first cicatrix a second one, contiguous to it, is noticed, the shape of which, sometimes circular, is most frequently elliptical, and, more or less flattened. Very often it forms, above the surface, a prominence more or less decided; it is the point of union of the lateral with the main root. On large roots two of these prominences are observed, situated at different and nearly diametrically opposite points. A transverse section, properly made on a plane parallel to the exterior surface of the lateral cicatrix, displays quite an extended colored cortical zone, and an interior structure very circumscribed, and of a whitish color.

The surface of the body of the root presents traces of radicles which have been separated. These impressions are disposed almost invariably in six or eight vertical and almost rectilineal lines. They are also quite frequently arranged in horizontal lines less regular than the vertical.

If, in an adult root with a surface marked as described, in fine ridges, a transverse section very near the base be made, it will often be found that the concentric constituents of the root are not plainly distinguishable. The central portion, the contour of which is circular, and the cortical portion, present a uniform more or less light clear tint, and in this case the vascular fascicles are not apparent. At other times, the central portion remaining circular, is of as deep a brown tint as that of the cortical portion; but the vascular bundles, very numerous and bound together, form a continuous zone, very narrow, and of a lighter color than the rest of the tissue.

A transverse section, made about the middle of the root, displays a medullary portion bounded by a broken line of a little deeper color than that of the adjacent tissues, which are generally but slightly colored, while the epidermis is a deep brown. The broken line, or medullary sheath forms a star generally of seven or eight angles, more rarely of six, at other times of many more; but in these specimens all the angles are not equally clearly marked. The stars with six, seven or eight points are the more regular. In the specimens showing six or eight angles the points have appeared to me to correspond exactly to the longitudinal row of radicles; so that a root having eight radicles of the vertical series will always contain a medullary casing, presenting not less than eight radicles, though more than this number may exist. Nor have I been able to discover a pentagonal medulla, seeing that the roots never have less than six series of vertical radicles. The broken line which indicates the limits of the medulla is, in fact, composed of a series of slightly curved lines, the convexities of which are turned toward the axis of the root, while their intersections are directed alternately toward the periphery and toward the axis. In each of the exterior angles may be perceived a sort of corner, the point of which is directed toward the axis, while the base seems to be confounded with the apparent summit of the angle of intersection. I say apparent summit, for the real summit is replaced by the space which I have described as a corner. Each of these corners constitutes a group of vascular fascicles, and there are of these at least as many as there are points to the medullary star; when there are eight of them, they are almost constantly found at the summit of the eight angles. But, in other cases, fascicles, after six of them are placed at the angles of the medulla, may be disposed on the sides of the star, and these present but very imperfectly, the form so characteristic of those more regularly arranged.

The cortical part of aconite root contained between the medullary sheath and the epidermis is divided into two zones of very unequal extent by a delicate brown line very near the epidermis. This line, which is not always very apparent, is the kernscheide.

The internal zone is slightly colored and very large; the external zone, much narrower, presents a more or less deep brown color.

Finally, in a section made close to the end of the root, the same concentric layers are found, but with some peculiarities of disposition. Thus the medullary space becomes circular, and the vascular fascicles are not easily distinguishable. When they are to be seen they have generally coalesced, and form a continuous zone. The fracture of the root is clean and starchy; they have not yet produced stalks, and, consequently, their degree of development is not far advanced. M. Duquesnel rejects them as inefficacious and poor in active principle. In roots older, and more grooved on the exterior, all the parts heretofore enumerated become less distinct, at whatever section of the root they may be viewed. The central portion, when it exists, is inconstant, and of color less deep than the cortical substance. The medullary outline is much effaced and often deformed; its angles in greater or less numbers have disappeared.

The position of the vascular fascicles is very uncertain. The cortical portion, of a fairly deep brown color, presents a kernscheide generally as sharp and well defined as the external bark.

The separation from each other of the several tissues becomes still more confused in roots which are very old, deeply wrinkled on the surface, compressed and greatly deformed by desiccation.

Generally in such specimens the medulla is entirely or partially wanting, and their interior is hollowed into lacunae, or even into a single large cavity.

These roots, which are the best for pharmaceutical purposes, have a fracture which may be described as spongy, resinous and soft.

Aconite root contains a considerable quantity of starch grains of varying form and size. The largest measures $\frac{15}{1000}$ of a millimetre, the smallest have dimensions nearly ten times less. Many of these grains are isolated, others are attached by a portion of their surface, two to two, or two to three. These are of like dimensions, or they may be divided in groups; in this case their relative volumes are very different.

The isolated grains are sometimes perfectly circular and nearly spheroidal, sometimes spheroidal in the greater part of their mass, and angular, triedral, in the rest. Grains presenting such irregular forms are certainly produced by the disaggregation of united masses, to which reference has just been made. Sometimes one grain is detached from a mass originally formed by three, and the remaining two grains, reunited by a limited surface, form a retreating angle, the two faces of which are distinctly seen with the microscope, bounded on the one hand by the common intersection, and on the other by the opposite surfaces continuous with the spherical portion of the grain.

Iodine colors the starch of aconite a deep blue.

The therapeutic value of the roots corresponds to differences observed in their structure dependent upon the age of the plant which has furnished them. It is, therefore, of the greatest importance to determine accurately that period of their growth, which ought to be preferred for gathering them, and, especially, to decide which of the two roots ought to be selected for pharmaceutical purposes. It is not sufficient to say that the most favourable time for collecting the plant is the autumn or winter, or even that they should be gathered after flowering or the fall of the stem; for I have observed that plants gathered at the end of autumn furnished but a small quantity of aconitine, and that, after drying, all the plants appear as warped and grooved exteriorly as the old roots, the richness of which in the active principle is entirely different, and much more considerable.

Persons little experienced, who are engaged in gathering aconite root, generally conform to the rule to collect it after the active period of vegetation has terminated; but, instead of retaining only the principal root of the plant which has passed through all the phases of its existence, which is ready to decay, and in which the medullary structure has more or less completely disappeared, they often, on the contrary, reject that, and preserve only the lateral root, of which the exterior aspect is much more inviting. But while the main root has had time to accumulate in its tissues a relatively large quantity of active principle, the other younger, since it has not yet developed its terminal shoot, is much more aqueous, more succulent and poor in alkaloid.

The young roots of which I have spoken above, although they were gathered in autumn, lost 62 per cent. of water in drying. The exterior surface is very analogous to that of the old roots, but, by a transverse section, it is seen that the medullary substance is intact as well as the angular line which circumscribes it, the fracture is also smooth and starchy.

Much has been written to determine whether it is better to employ the cultivated plant rather than that from the mountains. Schroff Van Praag, Ferrand, Debout, proscribe completely the cultivated plant; but Proctor has stated, on the contrary, that, by intelligent attention to its cultivation, it had with him been caused to develop a much larger proportion of active principle than the plants, grown in the wild state in Europe, contained. He estimated the percentage of increase to be doubled.

The French Pharmacopœia for 1866 very properly makes no distinction between the wild and cultivated aconite root. It is evident that the extraneous influences of soil, of climate, of exposure, which make themselves manifest in the forms of the different organs of the plant, must of a necessity have for a consequence an analogous variation in the nature and the proportions of their chemical principles; since in fact these principles are correlatives of the life of the plant.

The root of Aconitum Napellus, in the fresh state, has an appearance and odor which has caused it to be mistaken for Raifort root, an error which has been followed by serious and even fatal results. The resemblance between the two roots is slight; it is especially in winter, when the plants are deprived of their leaves, that they might be mistaken one for the other; at all other times the confounding of the two plants ought to be impossible.

Raifort root (Cochlearia armoracia) is perennial, three decimetres or more in length, furnished on the side with radicles disposed in four, more or less, rectilinear series. Its diameter often exceeds five centimetres, but it may be less. Its general shape is conical or almost cylindrical for the greater part of its length, and it rarely regularly tapers toward its end as does the root of Aconitum Napellus. On the contrary its terminal end, which is only a little smaller than its base, divides into two or more ramifications. The epidermis is of a pale yellow color, and sometimes its surface is marked by holes which have the appearance of being the remains of vesicles which had burst and dried. The interior surface is white, and the medulla always circular. The peculiar odor and taste of Raifort root, so decided and so characteristic, ought always to suffice for the prevention of errors. M. Bentley adds, as a very distinctive trait of the two roots, the change of color which a section of aconite root undergoes when exposed to the air: from white, it becomes reddish; while the root of Raifort remains colorless under like circumstances. This phenomenon of coloration of aconite root is not constant, and in the young roots, which more particularly resemble Raifort root in odor, I have not always found it to occur.

Many species of aconite, besides the A. Napellus, furnish the roots of commerce. These are, it appears, principally the A. Stoerckianum, variegatum, cammarum and paniculatum, the roots of which present no remarkable difference from A. Napellus, from which it is hardly possible to distinguish them. These roots are generally regarded as less active than that of A. Napellus. This inferiority on the part of A. variegatum and Stoerckianum has been established by Schroff, and on the part of A. paniculatum by M. Calloud. The root of A. Anthora, the structure of which is not different from the preceding, is regarded by many authors as destitute of active principles, while others (Hallen, Berg), attribute to it poisonous properties, only less than that of A. Napellus. In regard to this species, it is probable that its chemical constitution undergoes variations correlative with those changes which are observed in the exterior organs of the plant.

The root of Aconitum lupicidum is not napiform, but distinctly fibrous, elongated, more or less cylindrical, very irregular, provided with radicles scattered all over its surface without any regard to regularity. It terminates in a variable number of ramifications. In that species the root is single, and on one or two of its sides is observed a row of two, sometimes three shoots, placed from the base from above downward successively, and following a decreasing order in their development; the subterraneous parts which correspond to each of these shoots remain all joined together, and do not appear to separate at any stage of development of the aerial organs. But after having persisted a certain time, those of these parts which have fulfilled all the phases of their existence, disappear by degrees, and are destroyed. The stub of the Aconitum lupicidum, after some years of vegetation, presents the appearance on one of its sides of having been eaten away and hollowed out, while the other side, composed of young and more active structures, forms a sort of gutter, more or less thick and grooved. At other times, the stub is perfectly cylindrical exteriorly, but its axis is hollow throughout its length, and the walls of this cavity are covered with an epidermis similar to that of the exterior surface of the root. Radicles have sometimes been found enclosed in these cavities.

The transverse section of the fresh root of Aconitum lupicidum reddens in the air at the end of a few seconds, and its color is much brighter than that of the root of A. Napellus under like conditions. The pith of the uninjured root is perfectly circular.

The active principle of Aconite Napellus, as very certainly of almost all the other species of the same genus, is an alkaloid, *Aconitine*. This substance, beyond doubt, exists in a state of saline combination, for the juice of these plants, of the root as well as of the leaves, gives a decidedly acid reaction. In regard to the question whether it is an aconitic acid peculiar to these plants with which the aconitine is found in natural combination, M. Duquesnel bases his opinion that such is the case, from the fact that ether and chloroform also remove from the root its alkaloid as well as the aconitate which it may form.

This opinion will occasion surprise, since M. Mouchon, in his experiments on the etherole of aconite root, has not recognized in that preparation any trace of active principle, either by chemical analysis or by physiological tests.

The medium quantity of aconitine contained in one kilogramme of fresh aconite root is 0.50 grammes (*Fluckiger.*) From this quantity of root I have obtained 0.65 grammes of crystallized aconitine. M. Duquesnel has extracted from the dried root a quantity of the alkaloid, varying from two to four grammes per thousand.

The experiments instituted by Herapath relative to the comparative doses of the fresh and dried root, would seem to establish the fact that desiccation has not that wasting influence on the aconitine of the vegetable tissue which has generally, without sufficient evidence, been assigned to it.

The leaves of aconite contain six times less of aconitine than the root (Schroff).

By operating on the roots and the fresh twigs of the *same plants*, and thus securing conditions which would render a comparison possible, I obtained very nearly the same percentage of product from these different parts.

Aconite root contains also an albuminoid material, chlorophylle starch, fatty and resinous matters, acetic and malic acids combined, like the aconitic acid, with lime, mannite (T. C. H. Smith), cane sugar, a sugar which reduces in the cold cupro potassic liquor, and tannin.

The leaves contain a larger proportion of aconitate of lime, of tannin, and of ammoniacal salts.

TO BE CONTINUED.

NOTES AND ABSTRACTS FROM VARIOUS SOURCES.

Caramel.—Karl Kroetke (*Dingler's Polyt. Journal*) gives the following process for the preparation of this sugar color: Take sugar obtained from starch about 10 pounds, place in a porcelain kettle and heat, over an open fire. When the sugar has become liquified it must be kept well stirred to prevent it from rising and running over; a small addition of butter often prevents this, yet should this not allay the rising, the fire must be moderated. The sugar is now allowed to boil until there are indications of charring; now add carbonate of ammonia 3 oz. (coarsely powdered), and continue with a gentle heat until the mass becomes of a consistence which makes stirring difficult, and when a small portion is placed into cold water it becomes hard and brittle and imparts no sweetness to the taste. When this point has been reached, add slowly, with constant stirring, hot water, until the mass has been brought to the consistence of hot syrup. The operation can be performed in the space of an hour.—*Zeitschrift des Œterreichte Apotheker-Vereines.*

Tincture and Wine of Opium—When stored in cold depositaries, become turbid and throw down a deposit, and are frequently filtered when placed in the shelf bottle. When this is resorted to it is at the expense of the strength of the preparation, as part of the salts of opium are thrown out of solution by the cold, and will be redissolved by an even shop temperature.—*N. Jahrb. fur. Pharmacie.*

Prof. Bœttger (*Jahres C. d Physikal, V.*) suggests the use of glycerine as a test in examining volatile oils for fraudulent additions of alcohol. In a graduated tube place equal parts of glycerine and the suspected oil-shake well together, and allow to repose until a perfectly clear separation of the two liquids has taken place. The test is based on the complete insolubility of glycerine in volatile oils, and its great affinity for alcohol, which it extracts from the oils.—*Neues Report. f. Pharmacie.*

According to Von Kobell, small quantities of bismuth are detected in ores, by mixing equal weights of powdered iodide of potassium and the ore, and if this is free from sulphur, the same quantity of this latter. Place the mixture on charcoal, and heat by means of blowpipe. If bismuth is present the mixture will assume a scarlet red color by the formation of iodide of bismuth.—*Ibid.*

Hager reports a curious fact, namely, the finding of iron in gallic acid. This foreign addition, no doubt, was accidental, and had been masked by small additions of oxalic acid, as the appearance of the gallic acid was of proper color, until the same had been dissolved in water when the characteristic reaction of iron and gallic acid took place.—*Pharm. Central Halle.*

Experiment by Tyndall on Superheated Water.—The cause of steam boiler explosions is sometimes attributed to the fact that after water has been boiled for some time it loses the air which was dissolved in it, and when this point is reached it suffers peculiar modification. Water deprived of air does not vaporize slowly, but explosively throughout its whole mass. In order to obtain perfectly pure water, Faraday selected a clear piece of ice, which he allowed to melt with exclusion of air, and thus obtained water devoid of air with which to try the experiment indicated above.

Tyndall has modified this by taking two test glasses covered with a bell jar; in one he puts a small piece of ice, which he covers with a layer of oil: in the other undistilled water, also covered with oil. Both are brought to the boiling point; as soon as the one free of air reaches the degree of vaporization, it explodes, dashing the oil over the bell jar. The water in the second test tube boils away quietly in the usual manner.—*Journal of Applied Chemistry.*

Dry Acetate of Iron in Scales.—An iron preparation, which pharmacists call *ferrum aceticum siccum in lamellis* can, according to Hager, be easily prepared by allowing the liquid acetate of iron to evaporate in a flat dish at a temperature not to exceed 75° F. A pure soluble salt can be obtained, of a dark chestnut brown color, in scales and laminæ, if a solution of the acetate be poured upon horizontal glass plates no more than a millimeter in depth, and left in a dark, quiet place to evaporate, where the temperature ranges from 60° F. to 70° F. The dry salt thus prepared must be kept in closely stoppered bottles in the dark. It can be preserved in this way a considerable length of time, and is a highly prized iron remedy.—*Boston Journal of Chemistry.*

Imitation Frost Crystals.—A very pretty winter ornament for a parlor table can be prepared as follows:—

Dissolve 456 grains of nitrate of lead in six fluid ounces of water. If the solution is turbid, filter through paper. Place the solution on the table where it is intended to remain, and drop into it 200 grains of sal-ammoniac, in long, fibrous crystals. Small crystals of chloride of lead form and ascend through the denser liquid, presenting the appearance of an *ascending* snow-storm. When the lead is all precipitated, the crystals of chloride of lead begin to descend as a genuine miniature snow-storm, forming grotesque masses resembling a winter's landscape. If the vessel containing the crystals is not disturbed, it often preserves its beauty for a week or two.—*Ibid.*

A Substitute for Soda Lime.—Professor S. W. Johnson, in the *American Chemist*, proposes the use of a mixture of dry slaked lime and dry carbonate of soda in place of the soda lime used in Will and Varrentrap's method for the determination of nitrogen. He finds that a mixture of equal bulks of these two articles acts quite as well in expelling the ammonia as the soda lime; analysis of hippuric acid, uric acid, and ferrocyanide of potassium, affording results that agree quite closely with the theoretical amounts of nitrogen in these bodies. Other experiments were tried with sulphate of soda instead of carbonate, and these also were perfectly satisfactory. Chloride of sodium did not answer; nor would slaked lime or carbonate of soda alone liberate all the nitrogen. It is recommended to take equal bulks of well dried slaked lime and dry carbonate of soda prepared by heating the commercial supercarbonate of soda until moisture ceases to escape. These powders are to be well mixed by passing them several times through a sieve. The mixture is most conveniently kept in an air-tight fruit jar. It is used in the same manner as the common soda lime. It must at once commend itself to the favorable notice of all chemists who have frequent determinations of nitrogen to make, from the ease with which it is prepared and from the way it acts under the influence of heat, as it merely sinters together and does not choke the tube as soda-lime frequently does.—*Ibid.*

Syrup of Tar.—Mons. Latour gives the following formula in the *Repertoire de Pharmacie*:—

Tar, washed with boiling water	100	grammes.
White sugar	600	"
Powdered gum senegal	100	"
Water	400	"
Simple syrup	2,000	"

The tar must be triturated in a porcelain mortar with the sugar and the powdered senegal until a perfect mixture is obtained. Then the mixture should be turned into an evaporating dish, previously made hot, and the water, with sufficient of the syrup boiling, added. The mixture is to be continually triturated until a perfect emulsion is obtained, and the rest of the syrup, boiling, is to be added by degrees, having brought the syrup to the boiling-point, and strained while hot.

One part of the tar is contained in thirty parts of the syrup. M. Latour adds that a teaspoonful mixed with a tumblerful of bitter water gives a proper draught of tar-water, in which the tar flavor is well disguised.

Lead in Syrup of Iodine of Iron.—At the last evening meeting of the Pharmaceutical Society, Dr. Attfield showed a sample of Syrup Ferri Iodid, sent by Mr. Rimmington, of Bradford, containing a number of golden crystals of iodide of lead. Mr. Rimmington had traced these crystals to the iodine employed. Dr. Attfield said lead was often to be found in company with iron filings, but in this case iron wire had been used. Mr. Williams mentioned that he had himself found iodide of lead in his syrup, and had traced it to the iron. Mr. Umney had found the same impurity, but only when crude iodine had been employed. Resublimed iodine should always be used.—*Chemist and Druggist.*

New Method of Administering Medicines.—At a recent meeting of the Societe de Pharmacie of Paris, M. Limousin described some little envelopes of medicinal powders, hermetically wrapped in wafer paper, which he had prepared, the advantages claimed for which were that the doses were in every case rigorously exact; and further, that in each instance the name of the medicine was printed on the envelope, so that error was almost entirely guarded against. M. Limousin especially recommended these *cachets* for sulphate of quinine, rhubarb, etc., but he also mentioned their use in a more useful respect. This was to present in one envelope two substances, separated by a middle leaf of wafer paper, the result intended being that these substances would combine in the stomach, and form a salt in the nascent state.—*Ibid.*

Morocco Drugs.—At the recent evening meeting of the Pharmaceutical Society the *piece de resistance* was a paper by Dr. Arthur Leared, on some drugs collected during a tour in Morocco. Dr. Leared well retained the interest of his hearers, in his description of the physical features and vegetable products of Morocco. But it is difficult to obtain any information of much pharmaceutical or commercial value from that semi-barbarous country.

The products of Morocco are very various; especially curious is it, as was remarked by Mr. Hanbury afterwards, that caraway seeds, always regarded as indigenous to cold climates, should be exported thence. The native medicine men, jumbling together astrology and pharmacy, will by no means impart any information. The only chance of obtaining any information, is from the Jews, who, although degraded, oppressed and ignorant, are nevertheless observant and communicative. Gonorrhœa is extraordinarily prevalent all over the country, and many medicines are in common use as sexual stimulants. Cosmetics and fat-producing medicines are also popular among the women. We shall publish some of Dr. Leared's notes at an early opportunity.—*Ibid.*

Yield of Musk from Bags.—Thos. J. Covell communicates the following to the *American Journal of Pharmacy:*

Caddy.	Pods.	Original pods.	Musk.	Empty pods.
No. 1	24	20.75 oz.	7.125 oz.	13.625 oz. avoirdupois.
No. 2	20	20.75 "	6.500 "	14.25 " "
No. 3	29	24.00 "	7.000 "	17.00 " "
Total,	73	65.50 "	20.625 "	44.875 " "

Average for 1 pod, 392.5 grains; musk, 123.6 grains.

A New Solvent for Gun-Cotton.—Prof. Boettger has found that gun-cotton, or trinitrocellulose, is soluble in a boiling concentrated solution of protoxide of tin and soda. The solution is clear, slightly yellowish, and can be diluted with a large quantity of water without being turbid. The addition of an excess of hydrochloric acid precipitates a slimy mass, which, neutralized, is recognized as a regenerated cellulose, and is in the same gelatinous form as that obtained by precipitating an ammoniacal copper solution of cotton with hydrochloric acid. Since ordinary cotton is entirely insoluble in this soda-tin solution, this solvent can be employed as a test for the genuineness of gun-cotton, and also enables us to determine how much of the cotton has been converted into gun-cotton, for all the unchanged cotton will remain undissolved. —*Journal of Applied Chemistry.*

A New Indelible Ink.—The oily sap of the anacardium nut can be employed for marking cotton and linen goods with an indelible ink, as the color cannot be removed by alkalies or acids, and, in fact, is improved in intensity by the former. The preparation is best made by extracting the crushed nuts with petroleum benzine and leaving the liquid to digest at a moderate temperature for some time, and then to allow the volatile ether to evaporate in the open air. If we print with the syrupy residue on linen or woolen goods, at first the color is of a faint dirty brown; if it then be moistened with sal ammoniac or lime water, it immediately turns deep black, and cannot be bleached or removed by chloride of lime, cyanide of potassium, caustic alkalies, or acids. A good writing fluid has been prepared from the same nut.—*Ibid.*

ON DISINFECTANTS.

BY PROFESSOR CHARLES A. JOY.

The gradual breaking up of winter warns us of the approach of a season when the decay and putrefaction of organic bodies spreads abroad the germs of disease and renders the adoption of precautionary measures necessary.

It may be well to consider at this time some of the most approved disinfectants in order to be prepared for any emergency that may arise.

THYMOL.

This homologue of phenol exists in the volatile oil (oil of thyme) of the thyme, horse mint and Ptychosis ajowan, an umbelliferous officinal plant of the East Indies, and can be produced artificially by fusing the potassium salt of sulphocymolic acid with sodium hydrate, dissolving the fused mass in water, acidulating with sulphuric acid and distilling in a current of steam, when it passes over as a yellowish, viscid oil, lighter than water, which cannot be solidified either by cooling or by contact with a native crystal of thymol. There would thus appear to be two modifications of the substance.

In a concentrated form, it serves as a cautery for the removal of warts, and also in cases of hollow teeth is very efficacious, without leaving the disagreeable odor of carbolic acid or creosote. In aqueous solution (1,000 aq.) it has a cooling effect upon bad sores and stops decay. By the injection of a mixture of four grains thymol, two grains aniline and 100 grains glycerine into a dead body, all decomposition was arrested for months. It is a substance not generally recommended as a disinfectant, but from all accounts is worthy of trial.

XYLOL.

Xylol was discovered by Cahours in impure wood spirit. Owing to some uncertainty in the boiling point of this body, which Cahours put at 128° to 131° C. and Church at 126° C., as no body having such a boiling point could be found in coal tar naphtha, it was at one time thought that xylol did not occur among the products of the distillation of coal, but the careful and exhaustive researches of Warren and Muller have proved the existence of a body both in wood and coal naphtha possessing a boiling point of 140° C., having the vapor, density and chemical formula of the substance known as xylol. It is a liquid similar to benzole, yielding with nitric acid a nitro compound, and possessing the antiseptic properties of creosote and carbolic acid.

Warren put its specific gravity at 0° C. at 0.878, its boiling point at 140° C., and confirms the formula C_8H_{10}. Dr. Hugo Muller, of London, has prepared xylol from coal tar naphtha by fractional distillation until a distillate was obtained having the specific gravity of .866, and a boiling point of 140° C. He mixed the distillate with sulphuric acid, which forms colorless needles, from which xylol was subsequently obtained by dry distillation. Beilstein has found a solid crystalline compound boiling at 136° C., and fusing at 15° C., isomeric with xylol, about which we have at present but little information. Xylol has been strongly recommended as a remedy in cases of small pox, or the theory that when taken up by the blood it acts as a disinfectant. The disinfecting properties of xylol have not been so thoroughly studied as could be wished, and that is one reason for mentioning it in this connection, in order to suggest a more thorough examination of the subject. From analogy, it would appear to be more of an antiseptic than a disinfectant.

HYPONITROUS ACID.

A commission appointed by the French Academy to investigate the relative merits of various disinfectants gave a most favorable account of the action of hyponitrous acid to destroy infectious germs. For disinfecting a room of the capacity of 40 or 50 cubic yards, the materials were taken in the following proportions: 2 quarts of water, 3¼ pounds of commercial nitric acid, and ½ pound copper turnings. The mixture was made in a stoneware vessel, holding two or three gallons. The doors and windows of the room were carefully pasted up and left closed for 48 hours. At the expiration of that time the person opening the doors to air and clean the room must be protected by a suitable respirator. The disinfection will generally be found to be complete.

HEAT.

This is one of the oldest disinfectants known, and it is fortunately one very easy of application. In some of the European cities hot air chambers are constructed in which clothes and bedding are disinfected for the public at a moderate charge. The walls and ceiling of the compartment are built of brick, and its floor is composed of a perforated iron plate. The heat is supplied from the exterior surface of a coil of pipe, and no emanations from the infected clothes can pass into the open air and thus taint the surrounding locality. For want of a complicated apparatus, clothes can be disinfected in a common oven, the theory being that contagious germs are destroyed at a heat considerably lower than that at which the goods would be injured.

METALLIC SALTS.

Sulphate of iron, or copperas, is one of the cheapest and best. A pound of copperas, dissolved in two or three gallons of water, forms an excellent application to sewerage, removing its bad odor and stopping the growth of germs. Perchloride of iron has also been highly recommended by the Board of Health of New York, and, in combination with other substances, is known as "The Metropolitan Disinfecting Fluid." Chloride of manganese, chloride of zinc (Burnett's fluid), sulphate of zinc, sulphate of copper and nitrate of lead are employed where the cost of material does not stand in the way of their application.

CARBOLIC ACID.

It is hardly necessary to mention this agent, as it has recently come into general use. It prevents fermentation or putrefaction, and destroys the lower forms of life, but the disagreeable odor of the substance makes it objectionable for private dwellings. This odor can be advantageously masked by the employment of a solution of camphor in alcohol. The acid is sometimes mixed with some inert substance, such as sand or sawdust, or is poured upon thick millboard, or dissolved in water. Few chemical substances have been more thoroughly tried, and none have stood the test better than carbolic acid.

OTHER DISINFECTANTS.

Under this head I must remind the reader of chloride of lime, sulphurous acid, permanganate of potash, charcoal, dry earth, roasting coffee, and coal tar. I am conscious of omitting from my article a few chemical compounds that have been more or less recommended as disinfectants, but the list is complete enough for all practical purposes.—*Journal of Applied Chemistry.*

PHENOMENA EXHIBITED BY IODIDE OF STARCH.

BY E. DUCLAUX.

Abstract by Alexander Pedler, for the J. Lond. Chem. Soc.

Iodide of starch has been considered by some chemists to be a definite chemical compound. The author, however, considers that it is merely a case of molecular adhesion, and that the iodide is a true solution of iodine in starch, using that term in a very general sense. He bases his view on several of the physical and chemical characteristics of this body. In the first place, the composition of the iodide is by no means constant, as it can be obtained with the iodine varying from 2 to 41 per cent. Payen and Fritsche considered that it was a compound of 10 atoms of starch with one of iodine, containing 7.2 per cent. of the latter. Different methods of preparation, however, give products which vary very greatly in their composition. The formation of iodide of starch in solution depends essentially on three conditions: 1, on the quantity of starch; 2, on the amount of iodine present; and 3, on the quantity of water used. To prove the last case, the author takes a standard weight of starch, dissolved in different quantities of water, and adds a sufficient quantity of iodine to produce the blue coloration. Thus 100 milligrams of starch dissolved in 50 c.c. of water require 1.1 c.c. of a solution of iodine in water to produce the blue coloration. If, however, 800 c.c of water are used instead of 50, it requires 4.0 c.c. of iodine solution, and if diluted to 3200 c.c., it takes 23.4 c.c. of solution. These numbers show that in the presence of large quantities of water a considerable excess of iodine must be added to produce the blue color. It thus seems necessary for the solution to contain a certain ratio of iodine before its action on starch will commence. It was also noticed that the blue color obtained in presence of starch gradually disappears, and that the addition of a drop of chlorine water to the decolorized solution will bring back its color with the original intensity, showing that the iodine in the presence of excess of starch is probably converted into hydriodic acid. When iodine is added to a standard volume of solution containing varying quantities of starch, it is found that as the quantity of starch grows smaller, so does the quantity of iodine required to produce the blue color. Likewise, if to a blue solution of starch, distilled water is added, the blue color is considerably decreased, even when due allowance is made for the dilution of the liquid. The author has made some experiments on the blueing of starch in alkaline solutions by iodine, such as sodic hydrate, sodic carbonate, and hydrosodic carbonate. The sodic carbonate is supposed to be without action on solution of iodine, yet a considerable amount of iodine must be added to a dilute solution of sodic carbonate containing starch before the blue color appears. The quantity of iodine required varies proportionally with the amount of sodic carbonate in solution, the iodine used being sufficient to attack $\frac{8}{1000}$ of the sodic carbonate. The addition of a few drops of hydrochloric acid to a solution containing a small quantity of iodine with starch gives rise to an intense blue color. This is difficult to explain, on the supposition that a small quantity of iodide was present, as the hydriodic acid liberated is without action on starch. The hydric sodic carbonate is without action on solution of iodine in water, the first drop of the latter being sufficient to produce the blue coloration in presence of starch. Sodic sulphide solution acts on iodine, and it is curious that the combined effect of a mixture of sodic sulphide and carbonate is considerably greater than that of the same solutions when separate. Payen and Gobley have found that if alcohol is added to a solution containing a small quantity of iodide of starch, it is completely decolorized; and Goppelsroder and Schobin have found that certain salts, such as the sulphates of potassium ammonium, sodium, magnesium and aluminum, have the property of masking to some extent the action of iodine upon starch.

The action of heat upon iodide of starch is also dependent on the amount of the body in solution. Thus, starch-solution, to which 30 drops of iodine-water were added, was decolorized at 55°; a similar solution, with 60 drops of iodine-solution, became colorless at 75°; and a third, to which 280 drops were added, was decolorized at 90°. The substance which is called iodide of starch does not, therefore, possess any of the properties of a definite compound. It is not produced immediately on the meeting of the elements which give rise to it; the moment at which the action commences depends on the state of dilution of the liquid, on its temperature, and on the nature and proportion of the substances which it contains. It is a simple case of molecular adhesion, liable to the same disturbance as other cases of this class. There are some other substances which are colored blue by iodine, as, for instance, the gelatinous sub-acetate of lanthanum. Some of these observations have considerable importance on volumetric estimations by iodine when starch is used as an indicator. To insure the greatest possible exactness, the solution at the end of the analysis should be made as nearly neutral as possible. In the case of estimations of hydric sulphide, a rough determination of the amount is made, and two molecules of sodic carbonate are added for every one of hydric sulphide; another determination is then made, giving the following equation:—

$$H_2S + I_2 + 2Na_2CO_3 = 2NaHCO_3 + 2NaI + S.$$

At the end of the reaction sodic bicarbonate will be obtained which will be without action on the iodine. In the estimation of arsenious acid, it is better for the same reason to work with hydrosodic carbonate, and not with sodic carbonate.—*Ann. Chim. Phys.* [4], xxv, 264–284.—*American Chemist.*

WASHING-BOTTLES A CAUSE OF FIRE.

BY H. CARRINGTON BOLTON, PH.D.

On entering my laboratory this morning I was not a little surprised to see smoke, as from fire, ascending from a corner of my wooden desk. A single glance sufficed to reveal the origin of the incipient conflagration; the rays of the morning sun, streaming aslant through the uncurtained window, struck a large spherical flask filled with distilled water, and, being condensed by this quite powerful lens, were so nicely focused on a projecting corner of the wooden table as to cause intense local heat, attested by the charred and smoking indentation. The flask in question is twenty-two centimetres in diameter, and has a focal length of about ten centimetres.

Subsequent experiments showed that it had sufficient power to ignite brown paper, cigars, etc. These data are not given on the supposition of novelty. Lactantius (A. D. 300) mentions that a globe of glass, full of water, could, when exposed to the sun, kindle a fire, "even in the coldest weather," and Pliny recommends such lenses for cauterizing the flesh of sick persons; nevertheless, this morning's observation strikes us very forcibly as a rather novel possible cause of conflagration in cases of so-called spontaneous combustion. In our chemical laboratories, where highly inflammable substances are frequently exposed, washing-bottles, under suitable conditions, might occasion a disastrous fire, the origin of which would remain a mystery.

If the flask in question had so great power at nine o'clock in the morning, in the month of December, how much more intense would be the heat focused from an August midday sun!—*Amer. Chemist.*

School of Mines, Columbia College,
New York, Dec. 17, 1872.

SHELLAC.

Shellac has increased in sale of late years to such an extent, and has found so great a variety of new markets, that a passing notice of the advance made, as well as of the various uses and preparations of this gum, is no more than the subject well deserves.

Lac, in the crude, is a resinous or waxy substance, and is deposited by an insect on various kinds of trees in the East. Stick lac is the substance in its natural state, before its separation from the twigs which it incrusts, and the best is of a red purplish color. The chief sources of supply are Siam, Annam, Ceylon, Pegu, and more especially Bengal. Formerly there was little difficulty in securing a supply of the stick lac, besides the trouble of breaking off the branches and taking the product to market or the native refineries; but there is much more competition of late, owing to its greatly increased consumption by almost every civilized nation, and the new uses which have been obtained for it.

Seed lac is the stick lac separated from the twigs, appearing in a granulated form, and deprived of part of its coloring matter by boiling; this, however, is seldom imported into this country, and is for the most part manufactured into shellac in India. Lump lac is the seed lac melted and formed into cakes. Shellac, which is the common form in which it is imported into this country, is the substance strained, liquefied and formed into thin, transparent laminæ. The value is estimated according to its transparency and lightness of color. The best is of a bright orange; the liver-colored is inferior, and that which is very thick, dark and speckled should be avoided. The quality of shellac has improved of late years in almost as great a proportion as the quantity has been increased.

The two great outlets for shellac are the hatters' trade and the manufacture of varnishes, especially the latter. The hatters, who formerly used this substance with alcohol, now use it with ammonia. Common qualities are used in the manufacture of toys, photograph cases and rubber goods, besides button making and other purposes. But by far the greatest supply is consumed in spirit and other varnishes, the demand for this purpose having increased within the last 10 years as much as 300 per cent. For druggists' purposes an article is mixed with resin and other inferior gums and retailed for a variety of domestic and medicinal purposes. Good qualities now average from 45 to 50c. per pound, which, not very long ago, could have been purchased for 20 and 21c. Shellac reaches America, generally speaking, in cases of 200 lbs. weight, and the consumption and sale in New York reaches the figure of 6,000 cases, per annum. Another important use to which shellac is put in this country is in the manufacture of sealing wax, besides ink of certain descriptions. Lac dye or lac lake are two preparations of the coloring matter of stick lac, the former being the most valuable. They are imported in small square cakes, similar to those of indigo, and should when broken look dark colored, shining, smooth and compact, and when scraped or powdered, of a bright red hue. They are sometimes used as real dyes instead of cochineal. Although new sources of supply are constantly opening up, the consumption is progressing at such a rate that these new sources do not make up for the quick absorption of this valuable gum.—*Oil, Paint and Drug Reporter.—Jour. Applied Chemistry.*

THE TESTING OF CITRIC ACID.

BY HERMAN KAEMMERER.

Translated by Romyn Hitchcock, Assistant in Chemistry in the Lehigh University.

The following translation is an extract from a paper upon citric acid by the above author in Fresenius' *Zeitschrift*, 1869, p. 298.

In a lately published article on citric acid (Ann. d. Ch. u. Pharm.), I brought to notice that the new barium salt of this acid, discovered by me, $Ba_6''(C_6H_5O_7)_4 \times 7H_2O$, through the very characteristic form of its crystals and its insolubility in water, was particularly suitable for the qualitative detection of citric acid, especially when its presence in only small quantities with other vegetable acids is to be ascertained, the separation of which, according to the ordinary methods, is not exact, and the certain detection only accomplished by the use of large quantities of the material.

As I, in the meanwhile, have found a far simpler process for producing this salt than that described in another place, permit me here to briefly communicate the same :—

If one precipitates a soluble citrate in any manner with barium acetate, there forms while hot, as well as at ordinary temperatures, an amorphous precipitate of the salt $Ba_3''(C_6H_5O_7)_2 \times 7H_2O$. If one adds, after the precipitation, an excess of barium acetate, and heats the precipitate with the liquid over the water-bath in a covered vessel, after several (generally after two) hours, the originally voluminous precipitate becomes contracted to a small volume, hard and gritty, and is now transformed entirely into the new microscopical crystalline salt, $Ba_6''(C_6H_5O_7)_4 \times 7H_2O$. The presence of other vegetable acids is without influence.

In the filtrate, if it contains barium acetate abundantly, plumbic acetate produces no precipitate of plumbic citrate.

There results from this a most convenient means for the qualitative recognition of citric acid, especially in vegetable juices, etc.

After separating the bases which may be present, as calcium or iron, and neutralizing the filtrate, this is precipitated with excess of barium acetate, the precipitate obtained digested with the precipitant on a water-bath, and then examined under the microscope. * * * *

If citric acid is to be sought for in very dilute solutions by means of barium acetate, it is absolutely necessary to evaporate to small volume, after addition of the acetate, for direct experiment has shown me that with great dilution only the needle-formed crystalline salt is produced. $Ba_3(C_6H_5O_7)_2 \times 5H_2O$.

For example, as I dissolved 1 grm. of the salt $2\ Na_3(C_6H_5O_7) \times 11\ H_2O$ in 500 grms. water, and mixed 50 grms. of this solution with barium acetate, there formed no immediate precipitate, whilst by heating on a water-bath there appeared an amorphous precipitate, which in a short time changed to needle-shaped crystals and into the salt $Ba_3(C_6H_5O_7)_2 \times 5H_2O$, but heat as long as I might it could not be transformed into the characteristic crystals of the salt $Ba_6(C_6H_5O_7)_4 \times 7H_2O$. On the contrary, it was entirely changed into this salt by concentration to a small volume. It appears thence to follow that baric acetate affects the change only with a certain degree of concentration, which is most certainly obtained by evaporation. In order to see how much citric acid could be recognized in this manner, I mixed 10 grms. of the solution mentioned, which contained 0.02 grm. sodium citrate, or 0.0107 grm. $C_6H_8O_7$, with barium acetate, and evaporated to a small volume. The separation of the salt $Ba_6''(C_6H_5O_7)_4 \times 7H_2O$ was so abundant that, indeed, the one-fifth part had sufficed to recognize the citric acid with all certainty.

The rest of thc article is taken up with a discussion of the formation of the citrates of lead $Pb_3(C_6H_5O_7)_2 \times 3H_2O$; copper $Cu_2(C_6H_4O_7)$, the water of crystallization is not given ; manganese $Mn_3(C_6H_5O_7)_2 \times 9H_2O$; zinc, and cadium $Cd_3(C_6H_5O_2)_2 \times 10H_2O$, and also $2Cd_3(C_6H_5O_7) \times H_2O$.

It is also shown that the ordinary methods for the detection and separation of citric acid are not to be relied upon. Drawings of the crystals of the barium salt above referred to, as seen under the microscope, are also given ; the crystalline form being of the clinorhombic prism.—*American Chemist.*

SULPHOVINATE OF SODA.

BY CHARLES RICE.

Having prepared this salt some time, and having tried several methods for obtaining it, I can recommend the following as yielding a good product at a moderate price:

Take of alcohol (sp. gr. 0.815), sulphuric acid (sp. gr. 1.830), each 64 fl. oz. Add the acid to the alcohol, contained in a large flask, in portions, at short intervals. At first the temperature of the mixture rapidly rises to 212° F., and violent ebullition takes place at each successive addition of acid, but this gradually ceases as the specific gravity of the mixture increases, and the last portions of the acid may be added quite rapidly. Cover it well, and allow it to stand for two or three days. The mixture of alcohol and acid should not be raised to the boiling point, since the yield of sulphovinic acid is thereby considerably diminished, while that of oil of wine, ether, etc., is proportionately increased. Pour the mixture slowly, while stirring, into five times its bulk of water, and saturate the acid liquid with carbonate of lime. Strain the liquid, wash the precipitated sulphate of lime, and add the washings to the filtrate, which now contains sulphovinate of lime. Add to the latter a solution of carbonate of soda, until it just ceases to give a precipitate. Instead of carbonate of soda, I have also used oxalate of soda, which, although requiring considerably more water for solution, and consequently a longer time for the final evaporation, has this advantage, that it effectually removes the whole of the lime salts, thus making filtration during evaporation unnecessary. Filter the liquid through filtering paper free from iron, to remove the precipitated carbonate of lime: wash the latter, and evaporate the filtrate until it measures about 70 fl. oz. Filter again from a small quantity of separated sulphate and carbonate of lime, and evaporate until a pellicle forms. Then set aside for a few days, and remove the crystals. It is very difficult to obtain more than one or perhaps two crops of well-defined crystals; the last mother-liquors deposit a number of hemispherical, knob-like crystalline masses, of a pasty consistence and exceedingly difficult to drain. I now prefer to evaporate the liquid at once to a syrupy consistence, and then, under constant stirring, to evaporate to dryness.

The product is a white granular salt, of a faint, ethereal odor, and a cooling, somewhat aromatic taste; it is very deliquescent, soluble in 0.7 parts of water, at 60° F., also soluble in alcohol, with which it is capable of forming a crystalline compound. When pure, BaCl solution should throw down no precipitate, or at least produce only slight cloudiness.—*American Journal of Pharmacy.*

AMMONIO-CUPRIC OXIDE.

Cupric oxide forms several compounds with ammonia, and these compounds form salts in the same manner as a simple oxide. These salts may be readily prepared by adding ammonia to a solution of the salt of copper.

The pure ammonio-cupric oxide may be prepared in several ways. The easiest method is to prcipitate cupric oxide from a solution of the sulphate by cautious addition of ammonia, taking care to avoid any excess of the ammonia. Filter the prccipitate from the solution of ammonic sulphate, and then dissolve the oxide in an excess of aqua ammonia. It may also be prepared by allowing aqua ammonia containing a little ammonic chloride to trickle through copper turnings. The copper is oxidized by the air, and dissolves in the ammonia. This solution has the most intense blue color; and this color, indeed, forms one of the most ready tests for the presence of copper. All the compounds of copper and ammonium are decomposed by boiling, or by adding a large excess of water.

The solution of this compound will dissolve cellulose, which may be reprecipitated in the amorphous state by the addition of water. It has been lately proposed to use the solution for cementing paper together, and for waterproofing. For the first of these uses it is too expensive; and for the latter, aside from the expense, it is not a suitable material. The precipitated cellulose softens just as any other paper would under the influence of moisture. According to Erdmann, the cellulose is only held in suspension, and is not truly dissolved, but merely swollen, like starch in water. The ammonio-cupric compounds have always been rather a favorite subject of investigation with chemists, from the time of Berzelius down.—*Boston Journal of Chemistry.*

Hints on Filtration.—In order to filter and wash gelatinous precipitates, T. M. Chatard first evaporates them to dryness over the water bath, stirring them with a glass rod in order that they may dry in the form of fine grains. He then finds that they may easily be washed. Aluminic, ferric, and chromic oxides all work well when treated in this manner.

It is not generally known that the time of washing and filtering these precipitates may be shortened at least one half, by precipitating them from boiling solutions, and giving them a good boiling after precipitation, and then washing with boiling water. Indeed, it is a good rule always to precipitate at a boiling heat unless there is some good reason for the contrary.

EDITORIAL DEPARTMENT.

THE CHICAGO COLLEGE OF PHARMACY.

CLOSE OF THE SESSION OF 1872–3.

The sixth session of the Chicago College of Pharmacy closed on 28th ultimo, after a season of instruction which proved alike satisfactory to the students, and creditable to the College. The examinations for the degree of Graduate in Pharmacy, including both written and verbal questioning, were held during the following week. As a standard of proficiency required, the Board of Trustees adopted the rule that in no case should a diploma of the college be awarded to any one who failed to answer correctly at least sixty per cent. of all questions propounded. Our readers will be enabled to judge of the character of the examinations from the questions which we reproduce below.

The number of candidates for graduation was necessarily small, as the class was mostly composed of first course students, in consideration of this fact it was deemed proper to omit for this year the customary commencement exercises.

The following named students passed the required examination, and will receive the Diploma of the College:

NAME.	RESIDENCE.	TITLE OF THESIS.
Adolph G. Vogeler	Chicago	The Reactions which occur on mixing Corrosive Sublimate, Iodine, and members of the Aromatic Series.
Chas. Zimmerman	Peoria, Ill.	Colchicum.
Frank Snodgrass	Evanston, Ill.	Gossypium.

WRITTEN EXAMINATIONS.

CHEMISTRY.

PROF. N. GRAY BARTLETT.

1.—Define the terms *atom* and *molecule*, and give a chemical definition of an *anhydride*, an *acid*, a *base*, a *salt*.

2.—Give the symbolic formulas for the oxides of Sulphur, and the corresponding acids; explain the reactions in the ordinary manufacturing process for Sulphuric acid, and give tests for the detection of the acid.

3.—Indicate in symbols all of the oxides of nitrogen, and state which are capable of forming acids. How much HNO_3 (by weight) can be obtained from 432 grains of Saltpetre, by treatment with sulphuric acid?

4.—Give the atomic weights of Bromine, Iodine and Chlorine, and arrange the group in the order of the relative intensity of their chemical affinities. State the physical and chemical properties of Chlorine, and give the rationale of the U. S. P. process for Aqua Chlorinii.

5.—Give symbols for the oxides and acids of Phosphorus, and write typical formulas for tribasic, tetrabasic and monobasic phosphates, and for hypophosphites.

6.—Give a method of preparing Ammonia, and write formulas for the normal sulphate, the chloride, and the medicinal carbonate.

7.—Give an outline of the Leblanc process of Soda manufacture; also formulas for the normal and acid sodium carbonates, and explain the reaction which occurs in the U. S. P. process for Liquor Sodæ.

8.—Mention the important ores of Iron. What is the essential difference in the composition of cast Iron, wrought Iron and Steel? Give formulas typical of ferrous and ferric Salts, and indicate in symbols the reaction in preparing ferric Hydrate. (Ferri oxidum hydratum., U. S. P.) Give tests for Iron in both ferrous and ferric states.

9.—Give formulas for the oxides of Mercury, and state how they may be made. How is Calomel prepared and in what manner may a contamination by corrosive sublimate be detected?

10.—Give formulas for the oxides of arsenicum, and mention the officinal preparations into which the element enters as an ingredient. Give the principal tests for its detection, and mention antidotes for arsenical poisoning.

PHARMACY.

PROF. JAMES W. MILL.

1.—Give a history and description of the U. S. Pharmacopœia and U. S. Dispensatory.

2.—Give a definition of the term *weight*, and state the conditions on which depend the accuracy of a balance. Give the system of weights and measures adopted in the U. S. Ph., with the officinal denominations. Calculate the weight of 25 fluid ounces of water at 60° F.

3.—What is the foundation unit of the Metrical System of weights and measures? How is it obtained, and what is its equivalent in English inches? Convert 6½ lbs. Av., into Troy ounces, and also into Grams and Kilograms.

4.—What is understood by the specific weight or gravity of a substance? Give the *modus operandi* of taking the sp. gr. of both a liquid and a solid substance, with the principles involved. Is sp. gr. always a test of Quality? Give an instance where it is, and one where it is not, with the reasons therefor.

5.—What is the sp. gr. of Æther, Æther Fortior, Chloroformum Purificatum, Glycerinum, and the officinal forms of Alcohol? Calculate the amount of absolute Alcohol, both by weight and by measure, contained in 35 Troy ounces of Alcohol U. S. P.

6.—Define the officinal terms Aqua, Liquor, Tinctura, Spiritus. Give the officinal formulas (Ph. 1870) for Syrupus, Ceratum, Unguentum, and calculate the amount of water and sugar contained in 15 pints of officinal syrup.

7.—Give a general outline of the process of percolation, including a statement of the principle involved, and the conditions necessary to its successful execution. What is meant by the officinal terms, coarse powder, moderately coarse, moderately fine, fine, and very fine?

8.—Give the names in full of the officinal liquid preparations of opium, and the amount of each equivalent to one grain of the powdered drug, also the names in full of the officinal liquid preparations of Iodine, and their relative Iodine strength.

9.—Indicate in symbols the chemical composition of Alcohol. State how the term, Sweet Spirit of Nitre, originated. Give its present officinal and chemical name. Describe the officinal, or any other process for its preparation, and explain the reactions that take place. What is the sp. gr. of the officinal spirit? What is the character of this preparation in the ordinary market?

10.—Give the names in full of the officinal scale preparations of Iron, and describe their mode of preparation. Calculate the amount of $Fe\ I_2$ contained in 15 fluid ounces of Syrupus Ferri Iodidi.

MATERIA MEDICA.

PROF. D. B. TRIMBLE.

1.—In general—what form the active principles of plants? What are the terminal letters of one class, in the English form, and what are their ultimate constituents, generally?

2.—How are oils classified? In what characteristics do the volatile oils differ from the fixed oils? What is the general sp. gr. of oils, as compared with water, and which are heavier than water? Which is the heaviest volatile oil, and its sp. gr.? Which the lightest, and its sp. gr.?

3.—What is opium? From whence do we obtain our chief supply? What are its characteristics, as seen in commerce and how would you distinguish opium of an inferior quality?

4.—What are the alkaloids of opium? What their general effect upon the system? What one differs from the rest in this respect, and how? Which is in most general use, and what are its characterictics?

5.—What is Cinchona? How did it receive its name? Where does it grow? What are some of the chief species of the tree? What are the different varieties found in the market? On what do its active principles depend?

6.—What are the Alkaloids of Cinchona? From which of the varieties are the different alkaloids most abundantly procured? Which of the alkaloids is in most general use? Which of its salts? Describe it. In what one peculiarity do the alkaloids differ, and how? What is their chief medicinal effect?

7.—What is Rhubarb? What are the principal species from which it is obtained? What are the varieties in the market? How would you distinguish good Rhubarb? What is supposed to be its active principle, and why? What is its chief medicinal effect?

8.—What is Ipecacuanha? From whence procured? In what part do its virtues chiefly reside? What is its active principle? What its medicinal effect?

9.—What are Aromatics? In what do their active principle reside? What are the principal Aromatics? For what are they generally used?

10.—What is Musk? From what animal is it derived? Where is its habitat? From what part of the animal is musk procured? How is it adulterated? To what class of Medicines does it belong?

SUBSTANCES SUBMITTED FOR IDENTIFICATION.

Hyoscyami Folia.
Sinapis Alba.
Belladonnæ Folia.
Sinapis Nigra.
Buchu.
Capsicum Annum.
Digitalis.
Stramonii Folia.
Senna.
Salvia.
Aconiti Radix.
Senega.
Hedeoma.
Serpentaria.
Cataria.
Cypripedium.
Prunus Virginiana.
Hydrastis.
Lobelia.
Chenopodium.

Zinci Acetas.
Potassii Nitras.
" Bichromas.
" Chloras.
" Ferrocyanidum.
Sulphur Præcipitatum.
Zinci Sulphas.
Sodii Carbonas.
" Boras.
Potassii Iodidum.
Plumbi Acetas.
Magnesii Sulphas.
Sodii Phosphas.
Magnesia.
Ferri Subcarbonas.
" Sulphas Exsiccata.
Calcii Hypophosphis.
Potassii Permanganas.
Hydrargyri Oxidum Rubrum.
Ferri Subsulphas.

LIST OF STUDENTS OF THE CLASS OF 1872-73.

NAMES.	RESIDENCE.	PRECEPTORS.
Ackerman George H.	Chicago, Illinois	J. H. Wilson.
Buchman Henry W.	Do.	A. E. Ebert.
Carlton H. L.	New Haven, Ct.	E. H. Sargent.
Colby Dow B.	Kewanee, Illinois	
Cowdrey Robert H.	Lafayette, Indiana	Schweyles & Bros.
Curtis H.	Geneva, Wisconsin	
Eberhart F. S.	Des Moines, Iowa	Wm. Baker.
Fehland Otto	Mayville, Wisconsin	F. W. Dodge.
Ford Charles M.	Chicago, Illinois	J. W. Mill.
French J. A.	Knoxville, Iowa	J. T. French.

LIST OF STUDENTS—*Continued.*

NAMES.	RESIDENCE.	PRECEPTORS.
Hautau Henry	Chicago, Illinois	F. Fuhring.
Hogan L. C.	Pontiac, Michigan	J. H. Fry.
Hoffman G. A.	Chicago, Illinois	
Hoyt George W.	Do.	T. H. Patterson.
Krusemarck C.	Do.	Mead Bros.
Lewis Fred. M.	Dodgeville, Wisconsin	
Marshall J. H.	Lockport, Illinois	E. Bradley.
McClelland Robert A.	Chicago, Illinois	Bliss & Sharp.
McDonald J. L.	Do.	
McNeill Thos.	Galena, Illinois	McNeill & Co.
Merz Frank	Chicago, Illinois	G. M. Hambright.
Rozenthal Joseph	Rochester, Indiana	M. Danzieger.
Rohrer Joseph	Chicago, Illinois	H. Biroth.
Sackett R. W.	Creston, Illinois	
Snodgrass Frank	Evanston, Illinois	
Smith Thos.	Canada	
Stoddard A. S.	Chicago, Illinois	Huntoon & Hall.
Stoddard George B.	Do.	
Stahl E. L., Jr.	Do.	E. L. Stahl.
Seibert G. F.	Do.	
Vogeler Adolf G.	Do.	W. D. Broomhead.
Walter Jacob	Do.	
Wanzer Hiram, M.D.	Chicago, Illinois	
Wellcome Henry S.	Rochester, Minnesota	S. C. Wellcome.
Whipple C.	Champlain, N. Y.	Wheeler & Griffith
Wright C. W.	Utica, Ohio	A. Boyd.
Zimmerman Chas.	Peoria, Illinois	Wm. H. Davis.

ANNUAL MEETING OF THE CHICAGO COLLEGE OF PHARMACY.

The annual meeting of the Chicago College of Pharmacy was held in the college rooms, Wednesday, March 5, 1873, the President, Mr. Buck, presiding. Upon calling the roll the following members responded: Messrs. Patterson, Biroth, Buck, Blocki, Ebert, Hooper, Huntoon. Huyck. Mill, Mead, Milleman, Sargent, Whitfield, Sweet, Vanderburg, Willson, Jauncey, Goebel, Wheeler, Borcherdt, Bartlett and Jamieson. The minutes of the special meeting of the college, and of the several meetings of the Board of Trustees, were read, and, on motion. approved. The reports of the standing committees being called for, Mr. Patterson, Chairman of the Committee on Rooms and Library, made a verbal report; Mr. Bartlett read a report in behalf of the Committee on Cabinet and apparatus, and a verbal report from the Committee on Examinations was made by its Chairman, Mr. Whitfield. In the absence of the Chairman of the Committee on Deceased Members, Mr. Ebert announced the death of Dr. Casselman, of St. Petersburg, Russia, and

Prof. Herman Ludwig, Jena, both honorary members of the Chicago College of Pharmacy. Mr. Ebert, in short obituary notices, paid a merited tribute to the memory of these deceased members, both having been eminent for their scientific attainments, and for their devotion to the cause of pharmacy.

Mr. Whitfield, Chairman of Publishing Committee, reported the financial condition of the PHARMACIST to be highly satisfactory.

The various reports were, on motion, accepted, and placed on record.

The retiring President then read a very able address, reviewing the rapid and progressive strides made during the past year, in the work of re-establishing and refitting the College in a substantial and creditable manner. He also referred to the unbounded generosity of our professional brethren in Great Britain and Europe in the material aid which they had contributed, with especial reference to Prof. Attfield, whose untiring labor on our behalf has placed us under lasting obligations to him. The president concluded with well-timed suggestions as to the proper course to be pursued in the future to secure the greatest usefulness of the College.

At the conclusion of the address, a committee was appointed to take into consideration its various suggestions.

The election of officers and trustees being then in order, an informal ballot was taken for presidential candidates. Mr. Ebert received a plurality of votes, but declined to be considered a candidate for the office. Regular ballot was then proceeded with, and the following were declared duly elected:

Thos. Whitfield, *President.*

Henry Sweet, *1st Vice President;* A. C. Vanderburg, *2d Vice President.*

Thos. H. Patterson, *Secretary.*

T. N. Jamieson, *Treasurer.*

Albert E. Ebert, *Corresponding Secretary.*

Trustees.—Messrs. N. G. Bartlett, Geo. Buck, Henry Biroth, W. F. Blocki, J. C. Borcherdt, E. H. Sargent, M. E. Huyck, J, W. Mill, J. H. Wilson and J. H. Hooper.

On motion, a vote of thanks was tendered to the retiring officers for the efficient manner in which they had attended to their official duties during the past year.

The President elect, Mr. Whitfield, was conducted to the chair, and acknowledged the honor which had been conferred upon him in a few well-timed remarks, and pledged himself to perform the duties of the office to the utmost extent of his ability.

On motion, the secretary elect was directed to communicate with the retiring secretary, requesting a report for the past year, the same to be presented to the adjourned meeting of the college.

The various proposed amendments to the constitution and by-laws were not taken up for want of time, and it was decided to consider them at an adjourned meeting.

On motion, the meeting adjourned, to re-assemble April 2d, 1873, at three o'clock p. m.

T. N. JAMIESON, *Secretary, pro tem.*

Attention has been called to the following typographical errors which escaped correction in a few of the earlier copies of the U. S. Pharmacopœia.

On page 262, in the second process of Pyroxylon, instead of *two* troy ounces of sulphuric acid, read *ten.*

In the formula for Spiritus Chloroformi, page 275, instead of *diluted* alcohol, read *alcohol.*

The College of Pharmacy is lately in receipt, from the author, of a thesis on the Aconites and Aconitine presented at the Superior School of Pharmacy of Paris, by Charles Patrouillard, 1872. This is a masterly and exhaustive essay, and we have determined to give our readers the benefit of the parts of the work of the most importance to the pharmacist. For this number we translate the chapter on Aconite root, and we invite the attention of our readers to the admirable manner in which the talented author of this paper has held the mirror up to nature in his dissertation. In the next number will appear the chapter on the Processes for the Extraction of Aconitine.

CORRESPONDENCE.

Editor of The Pharmacist:

My Dear Sir:—Below is answer to "Enquirer Harrisburg."

Tinct: Kino Comp: *

Take of Pulv: Opii,
" Kino,
" Cocci, of each ʒ ii.
" Camphoræ,
" Caryophylli, of each ʒ iii.
Spt: Amm: Arom: fl. ʒ ii.
Alcoholis, q. s.
Mix for 2 pints of liquid.

Also,

Eau Sedative de Raspail.

	Codex.	No. 2.	No. 3.
Take of Liq: Ammon: (20 per cent. NH_3)	60.	80.	100.
Spt. Camphoræ, (Ca. Alc. 15 to 50)	10.	10.	10.
Chl: Sodii,	60.	60.	60.
Aquæ,	1,000	1,000.	1,000.

Mix for 2 pints of liquid.

Respectfully yours, etc.,

Thos. J. Covell.

Jersey City, N. J., March 10, 1873.

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* Similar recipes were forwarded by Mr. Wallace Proctor, and Mr. C. W. Hancock, Philadelphia.

THE PHARMACIST

AND

CHEMICAL RECORD.

VOL. VI. CHICAGO, APRIL, 1873. NO. 4.

OUR PHARMACOPŒIA.

BY WM. L. TURNER.

The committee appointed by the convention of 1870 to revise the Pharmacopœia say in the preface to the work, that "in accordance with the resolutions of the convention, the scope of the work has been extended rather than abridged," and that "it has been the desire of the committee to adapt it to the wants of our extended country, without losing sight of the conservative character necessarily pertaining to a national Pharmacopœia." When the committee say that "such a work must necessarily follow in the wake of advancing knowledge," I can entirely agree with them, but this proposition does not necessarily follow the previous assertion, that a conservative character necessarily pertains to a national Pharmacopœia.

I wish just here to say that I have neither a desire nor an intention to find fault with the committee; on the contrary I think they earnestly discharged the duties entrusted to them, and deserve the thanks of all who are interested in the work, and yet I seriously question, whether the Pharmacopœia is or ever will be adapted to the wants of our extended country, or will become what it should be, not only in name but in reality, a national standard alike for Physician and Apothecary, until it has had a radical rather than a conservative revision.

I use the word radical in this connection in no ultra-liberal sense, but in its strict derivative acceptation and in opposition to conservatism.

In this age of progress when the old macadamized roads to knowledge are being rapidly obliterated and their place or purpose supplied by steam and lightning; when progress and reform is indelibly stamped and legibly written all along the highways of knowledge, displacing the old conservative finger boards which served to guide the ancient traveler in the paths of literature, science and art, it is little short of folly to talk of conservatism as an essential feature of our national Pharmacopœia.

Our Pharmacopœia has been already too long the conservator of antiquated formulas and favorite combinations, it has too long fostered the very evil, if evil it be, which it is designed to prevent, by encouraging a class of preparations and stamping the broad seal of "officinal" upon this combination and that article as if to rescue them from that oblivion to which some at least of them, in all probability would long since have been consigned. Can any good reason be given why the Comp. Syr. of Sarsaparilla should be rescued from the fate of Sand's, Townsend's and Bull's, or to attack a more formidable position is there any special reason why Huxham's Tincture should be so favored as not only to retain its place among the standards, but be elevated, if possible, above its former position by divesting it even of the color of a nostrum? Has the art of combination so far degenerated that combinations should be held sacred in proportion to their antiquity, while anathemas are pronounced against those who presume to claim some degree of merit for new combinations? Or do those who compile the Pharmacopœia assume the prerogatives of the Council of Trent, and determine which are worthy of being considered canonical and denounce all else as being unsustained by the evidences and proof of inspiration, and consequently heretical?

Does our Pharmacopœia occupy the position claimed for it, or accomplish the purpose of its projection? It is, it is true, a standard or guide in a measure, but in how great a measure? I venture to answer, just so far only as necessity requires in the absence of something better; that is to say, it partially occupies the position intended and becomes a recognized standard more by force of circumstances than by any absolute quality or general adaptability to the necessities of the times.

I am well aware that in the tendency of the age, and particularly in reference to investigations and processes which must in the very nature of things assume the character of experimental rather than be governed by general laws, or come within the scope of fixed science, there is an acknowledged necessity for some check upon the tendency to extravagance which crops out so prominently in the numerous forms, processes and specifics for all the pains and ills of life; but is the only or best means of checking this tendency, that of discriminating in favor of one and against another merely upon the ground of greater or less popularity, or upon an assumed superiority recognized as real because venerable? Or would it not be better to discard from the officinal list all combinations, recognizing only such formulas as science and experience should demonstrate to be best adapted to the purpose of extracting, preserving and dispensing the medicinal properties of such drugs as experience warrants, scientific investigation proves, or accidental discovery demonstrates to possess remedial properties, and leave the combining proportions, and *tertium quid*, where it properly belongs, to those who prescribe or administer them.

In the several revisions of the Pharmacopœia, there has been a manifest tendency in this direction, discernible mainly in the efforts made to curtail and simplify as much as possible combinations previously regarded as worthy to enter the list, but this has been manifested perhaps more prominently in the last, in the character of the additions made to the Preparations which, though eighty-two in number, two only, Lead and Opium suppositories, and Morphia and Ipecac Troches, may be said to be compounds in the strict sense of the term; and these I apprehend were added more for some other reason, than because they possessed more merit than a vast number of compounds of a similar character.

I am aware that a change so radical would cause for a time some confusion, in consequence of the fact that the use of some compounds has become so general that it could not be suddenly checked, and as a consequence it might be said that they would continue in use without any guarantee of uniformity or reliability, but could not this be said of all the preparations which have from time to time been discarded and still continue in use; or of a host of compounds which have not been deemed worthy, some of which are prescribed far more frequently than many which are retained or added to the officinal list. In order to meet this objection, however, I would suggest a primary and secondary list not for more or less important *materia medica* only, but for the purpose of distinguishing officinal from unofficinal formulæ and crude articles, thus providing a process by which such articles and combinations could be easily and gradually retired or dropped: retiring from officinal or primary to non-officinal or secondary and dropping from secondary only.

There is another matter in connection with the revision of the Pharmacopœia which I consider worthy of the attention of those who are most directly interested, and that is the character or rather composition of the convention and also the committee of revision; any one who will look over the names of the last convention will find that of sixty members, forty-five of them were Physicians, and the committee of revision shows a majority of fifteen to ten. Why should our national Pharmacopœia be controlled and revised so entirely in the interest of one particular school of medicine as to exclude all matter not compatible with their particular notions of what should be regarded as remedial agents? or why should Physicians control it at all? There may have been, and in all probability was, a time when Pharmacy, or the art of preparing and dispensing medicines was confined almost exclusively to medical practitioners, but it might be said that "the art of healing had its origin in the woods," yet who in this enlightened age would consider the forest the best medical school?

Is it not time that a work ostensibly and really intended as a guide and directory for those whose especial province it is to prepare and dispense such medicinal articles and preparations as possess healing and curative properties, should reflect in a greater degree the knowledge and views of those most directly interested? or "follow in the wake of advancing knowledge" not at one end of a tow-line, the other end of which is securely fastened to some especially conservative craft; but as if on its own voyage of discovery, recognizing no favorite haunts, acknowledging no specially favored lines of travel, but regarding medical science as embracing all medical knowledge.

PHILADELPHIA, March, 1873.

ON THE PREPARATION OF SPIRITUS SAPONIS, LIQUID OPODELDOC, AND MEDICINAL SOAP.

BY G. H. BARKHAUSEN, IN BURGDORF, NEAR HANOVER.—TRANSLATED BY CHAS. C. FRIEDIGKE.

In the number for October, 1872, of this journal I spoke about the practical advantage of using potassa-soap in the preparation of the above articles.

Concerning the process in the preparation of soap with alcohol, I ventured suppositions at that time which are not sustainable. Bouis teaches us in his valuable work on the Theory of Saponification, Vol. 94, p. 330 of this journal, that for instance, in the treatment of stearin with 2 eq. KO dissolved in alcohol: 2 eq. stearate of potassa, and 1 eq. of stearate of the oxyde of ethyl, are formed, accompanied by separation of glycerine. Since all natural fats are considered as triglycerides—*i. e.*, as consisting of 3 eq. of acid to 1 eq. of oxyde of glyceryl—therefore the same process will take place when any trglyceride is treated with alcoholic solution of potassa. What I, for instance, looked upon as a decomposition of common soaps by alcohol into free alkali and acid stearate of potassa, is proved to be, according to the above theory, a separation of alkali caused by the simultaneous formation of stearate of oxyde of ethyl.

If instead of boiling stearin with 2 eq. KO in alcoholic solution, it is boiled with 3 eq. KO in aqueous solution, a neutral soap will also be obtained. In this case one-half more of KO is needed. Accordingly, one-half more of alkali in aqueous solution is requisite for the saponification of any fat, than when the alkali is dissolved in alcohol. This supposition was proved correct, as far as a superficial experiment allows to expect. Olive oil was saponified with 10.38 per cent. NaO, dissolved in absolute alcohol, this being the maximum with which the oil combines, forming a neutral soap. On the other hand, olive oil was treated with 24 per cent. NaO, dissolved in water, the lye separated from the soap by NaCl was found to contain 8.75 per cent. NaO, the saponification of the oil having consumed 15.25 per cent. NaO. By continuing the operation of boiling longer, as is necessary in the preparation of soaps with aqueous lye, the presupposed quantity NaO of 10.38 + 5.19 = 15.57 per cent., would probably have been approached closer. The combination prepared with 10.38 per cent. NaO (dissolved in absolute alcohol), since it contains ⅓ less alkali than the soap prepared with water, must be looked upon as consisting of 2 eq. stearate of soda and 1 eq. stearate of oxyde of ethyl.

This combination of 10.38 per cent. NaO, or 15.75 per cent. KO respectively, is easily decomposed by heating with water and a surplus of alkali, the alkali substituting oxyde of ethyl. Such a decomposition takes place readily with the small quantity of water contained in an alcohol of 86 per cent., but when heat is applied with a larger quantity of water, this decomposition takes place much more rapidly, the soap consuming in its formation 11.68 per cent. NaO, or 17.7 per cent. KO respectively. This combination, since it contains ¼ less alkali, would have to be considered according to the above explanation as a soap prepared with aqueous lye, consisting of 3 eq. stearate of soda or potassa and 1 eq. stearate of oxyde of ethyl. The same is more permanent than that with 2 eq. of stearate of soda: only after heating for some time with water and a surplus of alkali will it absorb 12 per cent. NaO or 18.5 per cent. KO; decomposition does not seem to proceed further, even by continuing the heat.

These are my views at present on the theory of treating soaps with alcohol, based upon the investigations of Bouis.

To sum up: olive oil saponifies with 16.5 per cent. KO, or 11 per cent. NaO in alcoholic solution at 100° Celcius; it saponifies with 18.5 per cent. KO, or 12 per cent. NaO, in alcoholic solution at 110° C., by the following addition of water and application of heat; but it can not be saponified with less than 25 per cent. KO, or 16 per cent. NaO, when they are dissolved in water.

The method of preparing spiritus saponatus, liquid opodeldoc and medicinal soaps, in order to conform as much as possible to the existing formula of the pharmacopœia, would be as follows:

1. SPIRITUS SAPONATUS.

Olive Oil, - - - - - - -	100 parts.
Filtered solution of caustic potassa in alcohol, containing 16.5 parts KO, - - - - -	300 “
Alcohol, - - - - - - - - -	250
Rose water, - - - - - - -	350 “

Dissolve the oil in the alcoholic potassa solution at 100° C., digest for about one hour, then add the other ingredients.

2. LIQUID OPODELDOC.

Olive Oil, - - - - - - -	100 parts.
Filtered solution of caustic potassa in alcohol, containing 16.5 parts KO, - - - -	300 “
Alcohol, - - - - - - -	600 “
Water, - - - - - - - -	400 “
Camphor, - - - - - - -	25 “
Oil of Thyme, - - - - - -	5 “
“ Rosemary, - - - - - -	10 “
Ammonia, - - - - - - -	40 “

Proceed as in the previous.

3. MEDICINAL SOAP.

Olive Oil, - - - - - - -	100 parts.
Filtered solution of caustic soda in alcohol, containing 12 per cent. NaO, - - - -	150 “

After solution at 100 C., evaporate with the addition of two or three hundred parts of water in a steam bath to dryness.

All three preparations contain glycerin, which does not impair the first, and may be of use in the soap, as it probably prevents it from becoming rancid. Common soaps, on becoming very dry, soon assume a rancid odor, caused by decomposition.—*Archiv. der Pharmacie, January*, 1872.

ESSAY ON ACONITES AND ACONITINE.—*Continued.*

PROCESSES FOR THE EXTRACTION OF ACONITINE.

Aconitine being a non-volatile alkaloid, all the processes which have been employed for its preparation are referable, excepting details, to one general method, which consists in extracting from the plant either the alkaloid in natural combination, or the alkaloid alone, by the aid of a suitable solvent; in precipitating the organic substance by an alkali, and finally, in purifying the product by repeated washings in alcohol or ether. For a long period this method was productive only of amorphous products, of very variable degrees of purity. Of late years, thanks to happy modifications, Groves in England, and Duquesnel in France have succeeded in obtaining the active principle of aconite, in its crystallized and pure form.

In 1808, Steinacher attributed the energetic properties of aconite to a bitter, acrid, volatile principle, which disappeared under the heat when attempts were made to extract it from the plant. Peschier and Brandes had a more correct idea of the nature of this principle. Finally, in 1833, Geiger and Hesse, each by his own process, extracted from the leaves of Aconitum Napellus, a peculiar substance—bitter, amorphous, extremely powerful in its action on the animal economy—to which they gave the name of *Aconitine.*

After this period, on account of inconveniences experienced in the preparation of this substance, and also, because of the excessive variability observed in the amount of product obtained from the plants used, it was concluded that aconitine was liable to spontaneous decomposition, or at least, to decompose under circumstances difficult to appreciate, and that by this decomposition a bitter substance was produced, which was lost by volatilization. Of late years, several chemists have striven to prove the non-volatility of aconitine, and even to establish its stability. Christison, among the first, declared that this substance did not disappear from the extractive liquors, when they were evaporated with precaution.

In 1866, Groves, by distillation of the plants, or of the fresh roots either with pure water or with water to which lime had been added, obtained nothing more than ammonia. With the view determining whether the ammonia was a product of the decomposition of aconitine, he made an experiment in which to the aconite roots employed, he added a certain quantity of that alkaloid and lime. The distillation of this mixture did not furnish a quantity of ammonia different from that which he had obtained from a similar experiment made in like manner, but without the addition of aconitine. Mr. Groves arrived at the conclusion from these experiments that aconite possesses no volatile principle to which its toxic power, in whole or in part, may be attributable.

I will barely refer to the processes for extraction of aconitine described by Geiger, Planta and Soubeiran, as well as that of the French Pharmacopœia of 1866, which is simply the method of Hottot slightly modified. All these processes being in some measure classical, I will select for description those procedures which have for several years past been published in France, and especially in England.

Geiger, in his researches, employed the leaves of aconite, Bley first made use of the root, and Soubeiran recommended that the juice of the root should be used. At present it is the dried root of Aconitum Napellus, and sometimes that of the Bikh of India, which are everywhere employed for the extraction of aconitine.

Dr. Turnbull, who has highly recommended the medical use of this substance in England, prepared it by macerating the root in alcohol. The alcoholic liquor separated from the plant was evaporated to a syrupy consistence. A quantity of ammonia was then added, sufficient, but not in excess. The precipitate thus obtained was treated either with boiling alcohol, or ether, which removed the alkaloid, or by cold, water, which took up extractive matters, leaving the alkaloid. This process has been reproduced in the London Pharmacopœia of 1826. It is there recommended in addition to mingle the alcoholic extract with water to separate a fatty, resinous matter, then to precipitate the filtered liquor with ammonia.

Morson, in 1837, exhausted the alcoholic extract with water containing sulphuric acid, and recommended the employment of animal charcoal to decolorize rapidly the liquors.

In 1865 Headland established the fact that animal charcoal caused the loss of much aconitine, and that this alkaloid was not so unstable that it could not be obtained by the use of boiling alcohol. To Morson's process he added, as modifications, the exhaustion of the root by boiling alcohol; then, after the precipitation of the alkaloid by ammonia; agitation with ether, which takes up the aconitine. By these means he increased the yield of active substance, and obtained a product as pure as when animal charcoal was used. Yet, this process presented a great imperfection in the matter of the separation of oleoresinous material, which so obstinately accompanied the alkaloid and could only be separated at great loss of active principle. It was to remedy this inconvenience that Proctor, jr., in 1861 proposed, before the precipitation by an alkali, the repeated agitation of the extractive liquor with ether, which dissolves the resinous matters better than the aqueous liquor itself. Besides, this manipulation removes the aconitic acid readily soluble in ether, so that afterward, the aconitate of ammonia which would have been produced in the course of the operation would not be mixed with, and effect the purity of, the aconitine. Mr. Proctor feared in fact that this salt was slightly soluble in ether. Messrs. T. and H. Smith employed the fresh root, the juice of which they evaporated to the consistence of an extract. This extract is taken up by alcohol, and the subsequent procedures are nearly the same as in the processes already described. Up to this time the products obtained were all amorphous and more or less pure, as already stated. The processes which remain to be treated of, and upon which I shall dwell more particularly, have furnished aconitine pure and crystallized. These are the methods made known by Groves of England and Duquesnel of France; that of the former, published first in 1866, subsequently modified in some important particulars in 1870, that of the latter, appearing in 1871.

The first results obtained by Groves were published in the proceedings of the British Pharmaceutical Conference at the third annual meeting at Nottingham, 1866. The following is a translation of his article:

"A concentrated tincture of aconite root is prepared by macerating for one week about two kilogrammes of the root with 400 grammes of methylic alcohol, to which 60 grammes of concentrated hydrochloric acid has been added. The methylic alcohol used is a mixture of 90 per cent. of ethylic, with 10 per cent. of real methylic alcohol. About five-sixths of this liquid are withdrawn by expression, to this half a pound of water is added and the alcohol is removed by distillation. The resin and oil separate by degrees. All the alcohol is finally driven off by heating the liquor in a large evaporating dish. From the cooled liquid the oily matters which float upon it are carefully removed. This operation, though tedious, should be most carefully conducted if a pure product is desired. To the filtered liquid a concentrated solution of iodohydrargyrate of potash is added; the whole is heated to about 100 C., being constantly agitated so as to collect the abundant resinous precipitate of iodohydrate of the alkaloid which is formed, of which the quantity is generally about 30 grammes. To decompose this precipitate the best method is to dissolve it in warm wood spirit and to treat it with a slight excess of nitrate of silver to eliminate the whole of the iodine. If large quantities of material are operated on, the liquor must be first treated with the sulphhydrate of ammonia, then by the acetate of lead; the mercury separates in the state of sulphuret, and the acetate of lead then removes the whole of the iodine. It is very important to obtain a perfect elimination of this latter substance; ammonia, in fact, does not precipitate the iodohydrate of alkaloid.

Mr. Groves also fortunately recognized that this combination of aconitine dissolves in ether, and that the acid liquors do not take up the alkaloid from the ethereal solution.

To return to the first method of eliminating the iodine. The filtered liquor contains at that time nitrate of mercury, the excess of nitrate of silver, and the nitrate of the alkaloid. The last salt is precipitated by the carbonate of potassa, and the mixture is agitated two or three different times with ether. It is better to separate beforehand the mercury and silver by hydrosulphuric acid. The ethereal solution leaves, when evaporated, a pale brownish residue, partly crystalline, partly amorphous, translucent and resinous. The mean yield from this process has been 1.4 grammes of the crystallized alkaloid per thousand.

This very long, very complicated and really not very productive process, was considerably modified by its author several years afterward, in an essay from which I here translate, from the Year Book of Pharmacy, 1870.

Aconitum Napellus, from a well-established source, was the material first employed in this experiment by Mr. Grove. The extractive liquor was prepared in the same manner indicated in his first trials, but in lieu of precipitating it by hydrargyropotassic iodide, it was agitated with animal charcoal to decolorize it, then an excess of ammonia was added. The abundant precipitate thus formed is agitated with ether till it is entirely dissolved. The ether is poured off, and agitated in turn with dilute hydrochloric acid, which takes up the alkaloid.

After a second pouring off of the ether, the acid liquor is precipitated by ammonia; finally the mixture is again agitated with ether to separate the alkaloid. The liquors should be used as concentrated as possible. The ethereal solution still a little colored yielded on evaporation brilliant white crystals, and a syrupy mother liquor. The last completely dried became resinous, fragile; heat of a water bath softened it, and according to Mr. Grove it is incapable of crystallization.

This very simple process yielded from three and a half kilogrammes of Bikh only 2.8 grammes of crystallized aconitine, and 8.4 grammes of amorphous product.

The yield therefore of pure product in this experiment was still inconsiderable. (The method of Mr. Groves is in reality only the resultant of all those which had been before employed.)

Finally, M. Duquesnel in July, 1871, *Comptes rendus* lxxiii, 207, presented a process as easy to put in practice as the last, to which I have just referred, and which seems to furnish considerable quantities of the alkaloid; since, according to the quality of the crude material (the root of A. Napellus), the author was able to obtain three or four grammes per kilogramme of the roots—a proportion much larger than Groves obtained in his experiments. The method of Duquesnel, as well as Grove's second proceess, is an application of the general method of Stas for obtaining alkaloids.

The root, reduced to a moderately fine powder, is mixed with one per cent. of its weight of tartaric acid, and treated with three successive macerations with 90 per cent. alcohol, of three days each.

The united and filtered liquors are gently distilled in a water bath, so as to remove all the alcohol, at as low a temperature as possible, and without exposure to the air.

I have realized these conditions by effecting the distillation under a feeble pressure in a closed apparatus, and at a temperature varying between the limits of 45° and 60° C.

The extract obtained is taken up by distilled water, and the liquor freed from oily and resinous matters by filtration. The aqueous solution of the acid tartrate of the alkaloid is agitated several times with perfectly washed ether, for the purpose of freeing it from some coloring material, also from a small quantity of oily and resinous matters which it still retains. After decanting the ether the alkaloid is precipitated by a slight excess of bicarbonate of potassa. I prefer to use the bicarbonate of soda in fine powder, for the sake of avoiding farther dilution of the liquor, and because the bitartrate of soda, being more soluble than the potassa salt, does not, like it crystallize on the sides of the vessel, and thus prevent a clear view of what passes in the liquor.

After saturation, the whole is agitated with quite a large quantity of washed ether, which takes up the aconitine. I have observed that if ether is not used in sufficient quantity, and if it be left in contact with the liquor twenty-four hours before decanting, small cystals of aconitine form on the sides of the flask. The ethereal liquor is left to spontaneous evaporation. Almost always the first deposition of crystals on the sides of the dish retain traces of coloring matter, and are imperfectly crystallized. Duquesnel states that this coloring material may be separated by pouring off the ethereal solution into another vessel, and adding one quarter of its volume of light petroleum. The foreign matter abandons the aconitine under the form of colorless crystals.

tained in crystals, sometimes quite large, or in pearly crystalline scales.

To purify these crystals it is better to re-dissolve them in dil. nitric acid, decolorize the solution by animal charcoal; the alkaloid is then ob-

Generally, I have obtained a yield of three grammes of the alkaloid for each kilogramme of the dry root; I have used alcohol in the proportion of five parts to one of the root. In several operations I finished the evaporation of the solutions in a vacuum at ordinary temperatures, with the view of avoiding the effect of the air and of heat.

The ethereal solutions of the alkaloid, before their evaporation, were dried over fused chloride of calcium, and then filtered. Evaporation took place from dishes placed on bricks, warmed in such manner that the temperature of the bottom of the dish reached as a maximum 30° C.

Evaporation under these conditions took place rapidly, and no particles of water condensed on the walls of the vase to disturb the crystallization, as occurs when the liquid is left to itself in contact with the air of ordinary temperatures.

Finally, by adding a small quantity of alcohol to the solution, the crystals formed, and at the bottom of the dish only, and not on the sides, as when pure ether was used.

With a purpose of ascertaining the influence of tartaric acid on the yield of aconitine, I took two equal quantities of the fresh root from the same collection, and treated them for the same time, under the same conditions, with the same quantity of alcohol; excepting that in one experiment tartaric acid was made use of in the (somewhat exaggerated) proportion of seven grammes to the kilogramme of fresh roots. I obtained from the root, treated with acidulated alcohol, .555 grammes of crystallized aconitine per kilogramme; from the root treated with pure alcohol, .682 grammes. These results demonstrate that the addition of tartaric acid is at least useless when the fresh root is used. Such a result might have been anticipated *a priori*, seeing that the juice of the fresh root has a decidedly acid reaction.

Comparative experiments, undertaken at Gottingen, in 1865, to determine the relative value of the different processes for the extraction of aconitine (amorphous) have demonstrated that the best method, as regards the yield, was one analogous, in its principal elements, to the one just considered. It furnished .860 grammes of aconitine per 1000.

Then came successively the exhaustion of the root by pure water, .830 per 1000, and finally the use of animal charcoal and dialysis producing respectively .760 and .630 grammes per 1000.

I have estimated the quantity of aconitine in specimens of the root of which I had but very small quantities, by the following method; the root, reduced to fine powder, was placed in a glass percolator and covered with alcohol of 92 per cent., to which one per cent. of tartaric acid had been added. The liquid was left in contact with the powder twenty-four hours. At the expiration of this time I let the alcohol run off, and poured new supplies upon the powder, until after leaving the percolator the alcohol produced no longer upon the tongue and the lips the characteristic physiological impressions of aconitine. The root may then be considered as exhausted. The alcoholic liquor is distilled in a vacuum at a temperature about 40° C.; then reduced to the consistence of an almost dry extract in the vacuum of an air pump; by these procedures the elimination of all of the alcohol is assured. The rest of the operation is conducted as per the method of extraction of Duquesnel. In redissolving the extract, the water used must be limited to a very small quantity, and this quantity, as far as possible, should be in proportion to the amount of extract obtained, with the view of having results susceptible of comparison.

EXTRACT FROM A REPORT ON THE UNITED STATES PHARMACOPŒIA.

READ BY DR. E. R. SQUIBB, BEFORE THE MEDICAL SOCIETY OF THE STATE OF NEW YORK, FEBUARY 5, 1873.

* * * * * A general view of the next subdivision of the Pharmacopœia, and the most important part of it, namely, the "Preparations," shows it to be, except in the points already noticed, mainly unchanged. The same array of long and yet insufficient, and now also long obsolete, formulas for Calomel, Cinchonia, Quinia and Morphia salts, etc., is still found, though the advisability of transferring all such to the Materia Medica List, with appropriate descriptions and tests, has been long and earnestly urged by many competent judges here, and has been illustrated by the example of foreign Pharmacopœias. It is really very difficult to know where to draw the line between processes appropriate to practical pharmacy and those which are not; but it must be drawn somewhere by the authority of the Pharmacopœia, and to do this with the least practical inconsistency is what should be aimed at. Hypercriticism never ends, and can neither be well defined nor avoided; but, to refuse logical inferences, and resist reasonable conclusions on account of this, cannot be wise.

It is to be regretted that saffron, an excellent corrigent and stomachic, is omitted from such preparations as vinegar of opium, tincture of rhubarb and senna, and compound tincture of cinchona. The general appreciation of its value, in the latter preparation especially, will not be likely to support this change.

An error in the process for vinegar of squill, which was pointed out soon after the revision of 1860, and has been repeatedly noticed by various authorities since, remains uncorrected, although the process has been rewritten by this committee.

The process for purified chloroform has been rewritten and considerably changed, and the standard of purity has been lowered from "s. g. 1.490 to 1.494" to "1.480." Perhaps all that the writer should say, in regard to this change, is to enter an earnest protest against lowering the standard; and that, from a considerable experience in the purification of chloroform, the old formula was a very good one, and the changes entirely unnecessary.

The officinal dried alum is now directed to be made from ammonia-alum; the maximum temperature is lowered from 450° to 400°; and the dried ammonia-alum is left with more water in it than the dried potassa-alum, formerly officinal. These changes are taken from the British Pharmacopœia, and therefore the committee adds that high authority to its own against the individual judgment of your reporter.

The process for benzoate of ammonia is taken nearly *verbatim* from the British Pharmacopœia, but the appended descriptive note is much more full than that of the British Pharmacopœia. The reasons for the introduction of this article into the Pharmacopœia are not known.

Bromide of ammonium, p. 83, is an important addition, and the process appears to be a very good one as an outline for any one who wants to make it. The last paragraph on the page is not clear—or at least is not understood by the writer—for, if no greater precision is attained than that indicated in the process, there will be more than two-tenths of a grain of moisture left in the salt, and then the seventeen grains of nitrate silver will decompose the whole of the bromide, and the further addition of nitrate-of-silver solution will cause no cloud.

Purified chloride of ammonium, p. 84, is also a useful addition, but the process is defective in adding the water of ammonia to a hot solution of the chloride, and in continuing the heat before filtration. Upon the large scale, at least, this does not accomplish the object, and the preparation will not, in a large majority of instances, stand the test by tannic acid, as given in the paragraph of tests.

Iodide of ammonium is another important addition.

The article on valerianate of ammonia, p. 85, has been rewritten with no perceptible advantage; but the note of description and tests, which is far more important, and is deficient in not identifying the separated acid, is unchanged.

In the process for oxysulphuret of antimony, p. 88, 7th and 8th lines from the foot, the phraseology is changed decidedly for the better.

Under carbonic-acid water, p. 90, an important paragraph is added to prevent insidious contamination with copper and lead, though the test given would detect these metals as well as others if present.

Under water of ammonia, p. 91, the phraseology is altered for the worse on the 15th and 17th lines from the top, since, if the phrase be grammatically construed, the "glass tube," and not the distant "two-pint bottle," is described as containing the water. Such points, however, would be surely hypercritical, except when they are the only changes, and changed from a better phraseology to a worse.

Creasote water, p. 94, should be filtered through a *wet* filter to prevent the passage of oily particles.

Under distilled water, p. 95, the new Pharmacopœia adheres to the phraseology of the old, where the direction is, to "distil two pints, using a tin or glass condenser, and throw them away." Query, what is to be thrown away? This peculiar phraseology was pointed out to the committee, so that it must be concluded that they consider it correct as it stands.

The processes for subcarbonate and subnitrate of bismuth, pp. 103, 104, are somewhat changed and much improved in several points.

The process for animal charcoal, p. 109, is amended materially by the direction, before omitted, to "heat it to redness, and, when cool, keep it in well-stopped bottles," but, unfortunately, this important amendment needs further amendment, for, unless the words "out of contact of air" be added after "heated to redness," the charcoal may be burned up.

The name of "Ceratum adipis, cerate of lard," is now changed to "Ceratum, cerate," p. 109. And Unguentum adipis, ointment of lard," to Unguentum, ointment," p. 326. At the last revision, these were, with rather doubtful propriety, changed from simple cerate, and simple ointment, to lard cerate, and lard ointment. But now, apparently to get them into harmony with "Syrupus, syrup," and "Mel, honey," they are again changed, so that the adjective, or qualifying, or class distinction of the name stands by itself, but, as the other parallel class distinctions, such as decoction, infusion, solution, spirit, tincture, etc., could not with propriety be used in this way, the discord is still as great as ever. The physician, who follows the Pharmacopœia, but sends to a pharmacist who does not know it critically, may have his prescription returned to him as incomplete. The change seems altogether uncalled for, unnecessary, and unwarranted.

The class "Chartæ," comprising two articles, is new. All the blistering and mustard papers now commonly used are, so far as your reporter's information and inquiries go, untrustworthy, and, where such things fail, valuable time is often lost. The cantharides paper is taken with slight modification, from the British Pharmacopœia; and the mustard paper is probably that of Mr. Crew, or something like it. If from these sources, and materially modified, the modifications may make them keep well, as the original prparations do not. At best they may be best classed with those "doubtful novelties of pharmaceutical science" which the Preface tells us the Pharmacopœia should not pander to.

The Pharmacopœia cannot be followed in keeping two out of the three collodions, p. 117, in "well-stopped," that is glass-stoppered bottles, unless an almost impossible degree of care be taken not to get the collodion upon the neck of the bottle or stopper to glue the latter in.

A cork, when glued in, can be dug out in pieces and a new one substituted; with glass this is more difficult.

The previous errors in the process for the confection of senna are properly corrected, and the formula and process are now unexceptionable.

The formula and process for digitalin are introduced with slight modification from the British Pharmacopœia.

In the officinal names of several of the alcoholic extracts, the characteristic word "alcoholic" is left off, as in those of aconite, arnica, colocynth, digitalis, etc., thus making the names harmonize with those of the watery extracts, while they are really equally alcoholic with those of belladonna, conium and hyoscyamus, where the word alcoholic had to be retained to distinguish between the more feeble watery extract of the fresh plant and the stronger alcoholic extract of the dry plant. Even to physicians and pharmacists, who are pretty well educated in the materia medica, this distinction has not been fully learned and appreciated in the past, and, now that a new and serious element of confusion has been introduced, it will be fortunate if grave mistakes do not occur.

Extract of American hemp is introduced, and is, so far as the writer knows, entirely new to the professions of medicine and pharmacy. A single monograph, written by Dr. H. C. Wood, Jr., of Philadelphia, contains all the knowledge on the subject; and, adopting the principle laid down in the Preface, the new Pharmacopœia follows in the wake of this single beam of "advancing knowledge," to gather it up and hoard it for use.

The formula for compound extract of colocynth is very much improved by taking purified aloes and an increased proportion of cardamom, but is still defective in mixing the separate powders instead of combining them by heat so that the soap, resins, and aromatic, may unite and form a compound rather than a mixture.

The extract of jalap, p. 143, still contains the expensive, inert, useless, and very troublesome watery extract, which more than ten years ago was taken in boluses large enough and repeated often enough to determine its character, and that by one of the members of the present committee. The committee seems persistently to refuse this as "advancing knowledge;" but in the parallel case of podophyllum, p. 146, gives a very much improved formula and process excluding this watery extract.

The extract of Calabar bean, p. 145, is an important addition, but the substance is taken in too coarse a powder, and the exhaustion is insufficient.

Under the important head of fluid extracts, a model process of percolation is first given. At the last revision model processes were rejected, first, upon the ground that in a book of reference, like the Pharmacopœia, each article referred to should be found complete; and, again, as a more intimate knowledge of the characteristic peculiarities and differences in drugs was obtained by investigation and experience, it was considered that no model process could be equally applicable to any considerable number of substances. Increasing knowledge and experience seem to have justified these conclusions of the last committee, yet the present one has reversed the action.

The revision of 1860 contains 25 fluid extracts, all of which are retained in this revision, except that of conium. Of the 24 retained, 10 contained sugar. This ingredient proved objectionable in practice, and the writer among others soon found that where sugar was desirable glycerin was far better, and these results were freely published, and glycerin was fully tried, though not always with the expected advantages. Nevertheless, wherever sugar had been considered indispensable, there seemed no doubt but that glycerin was better, and the writer everywhere advocated the substitution, but never its extension to other fluid extracts. Within the past two years, the practice of pharmacists and the usage by physicians both seem to indicate that, where glycerin is not absolutely necessary, it is objectionable. Such views are, however, not accepted by this committee, for, in following out their modification of Mr. Campbell's plan for the officinal fluid extracts, they have not only substituted glycerin for the sugar in the 10 old fluid extracts which contained sugar, but have introduced it into 7 of the old remaining 14 old fluid extracts after ten years' experience had proved it unnecessary, leaving now only 7 of the original 24 without it. Then the committee introduce 22 new fluid extracts, 17 of which contain glycerin, thus making a total of 46, of which the large proportion of 34 contain glycerin. This new officinal feature will not probably be generally followed and should not, and the Pharmacopœia will have to be satisfied with that degree of loyalty which adopts its now uniform strength for fluid extracts whereby each minim represents a grain of the drug from which it is made. Some other curious changes are unaccountably made in both old and new fluid extracts whose present value has been long established.

The process for tartrate of iron and potassa, p. 178, is not corrected, and it is therefore still impracticable.

Citrate of iron and strychnia, p. 179, is a new article of some importance, and the process seems to be a good one.

A new class of glycerites, p. 187, is introduced apparently from the British Pharmacopœia, since four of the five are found in that work. This may prove to be a useful class of preparations for external application.

In the formula for yellow oxide of mercury, there is an error which defeats the process, and yields oxychloride. The quantity of solution of potassa should be twenty-five troy ounces, instead of seventeen, p. 193.

Aconite liniment, p. 205, is also a useful addition, but it is in reality a fluid extract both in mode of preparation and in strength, and why it should be introduced here, as a liniment, it is difficult to understand, unless it be to secure it against internal administration. If this be the reason, it is not a good one, for the Pharmacopœia cannot wisely undertake to legislate against mistakes by erratic names.

The errors of directing purified chloroform in the chloroform liniment, p. 207, and in the solution of gutta-percha, p. 215, are still retained, though a commercial chloroform is provided for external uses.

The formula and process for soap liniment, p. 207, are reformed and very much improved.

An important alternative process is given for solution of acetate of ammonia, p. 208, which must prove to be a great advantage as well as a convenience, since it will always be freshly made as dispensed. It might have been wisely substituted for the old process.

A solution of chloride of iron, p. 211, is introduced, which is but the first part of the old process for the tincture of the chloride of iron, and then this solution is directed, at p. 208, to be used in making the tincture. This is simply making two preparations out of one, and, if the intention be to keep the materials seperate, and make the tincture as wanted, it is a mistake, because the older the tincture is the better, on account of the reactions which take place slowly for the production of an ether which is important to the preparation.

The process for solution of citrate of iron, p. 212, is rewritten, and materially improved.

The one-grain solution of sulphate of morphia is still retained, while an officinal formula for Magendie's solution is still refused. If local usages are to be provided for in simple solutions, both should be supplied. If confusion and mistakes are to be avoided, both should be excluded, and should be left to magistral prescription.

The process for chloride of zinc, like that for tincture of chloride of iron, is divided into two, and a solution of chloride of zinc is introduced at p. 223.

A citrate of lithia is very properly introduced, and by a good formula.

The processes for the oleo-resins are all rewritten, and improved; and a new one, oleo-resin of fern, meaning male-fern, is introduced.

Under the sub-heading of pills, p. 241, the Pharmacopœia is made again to depart from the admirable precepts of its Preface, and to illustrate how different it is, and how much more easy, to know a thing to write it, and to know a thing to do it. It cannot be too often quoted that the Pharmacopœia "should gather up and hoard for use what has been determined to be positive improvement, without pandering to fashion, or to doubtful novelties in pharmaceutical science."

Now, it is stated here as a mandate of this highest authority in the nation, that "the practice of sugar-coating pills is approved in reference to pills which are expected to be slow in their operation, but is of doubtful propriety in regard to those intended to act quickly, as the coating retards the solution of the pill-matter in the liquids of the stomach." When the Pharmacopœia thus goes half-way over to the wholesale pill-makers, the first question is, as to whether sugar-coating be a positive improvement which should be gathered up for use. If it be so, then the question of "pandering to fashion, or to doubtful novelties" in the drug-trade—for this is not pharmaceutical science in any sense—does not come up? If it be true that medicines commonly go into an empty stomach, and that when the organ is empty it is but a quiescent portion of the intestinal canal which would at once pass a bland, unirritating particle, like a sugar-coated pill, through the pylorus, the question of sugar-coating being a positive improvement must be considered as decided in the negative. But there is another aspect to this subject, which is of greater importance. Is the medical profession ready to hand over to the tender mercies of competing tradesmen another important class of medicinal agents, with the full knowledge that in so doing they must of necessity lose all check and control over it, and therefore must abandon all notions of precision and accuracy. In these cases we cannot afford to wait for evolution to determine the survival of the fittest, for the faithful manufacturer who may use the best materials and put on the most soluble coat with greatest skill cannot sell at the same price or profit as his less faithful competitor, nor can he spend so much upon agents and advertising; and, the landmarks of quality being all removed, the whole question is left open to that most precarious of all testimony, namely, individual judgment bssed upon casual observation.

Such changes as that made in the alums, the lowering of the specific gravity of chloroform to the trade standard, and this partial approval of sugar-coated pills, subject this committee to the charge of concession to the unsafe interests of trade in matters of vital importance.

The formulas for pills have all been rewritten with much care by a practised hand, without material change in proportion or dose, and are made to apply to small quantities applicable to the wants of dispensing pharmacist, so that they may always be comparatively fresh and soft. This, to a certain extent, obviates the necessity of adding glycerin to the formulas, to keep the pills from becoming hard. The tone and tendency of these changes is quite in opposition to the indorsement of sugar-coated pills, and will go far to induce the dispensing pharmacist to make his pills for himself. And, if this be skilfully done, there is no necessity whatever for sugar coating. It is to be regretted that this practised hand, which worked out these formulas, did not add the direction that pills should be kept in bottles.

The matter upon p. 249, of the pills, seems to be out of its proper alphabetical order, without any other discoverable reason than that the masses are not divided into pills as all the others are. This dislocation, however, renders these formulas liable to be lost when sought for by alphabetical order.

The processes for two of the resins are rewritten, with great improvement and advantage.

The British Pharmacopœia process, sometimes known as Redwood's process, for spirit of nitrous ether, is adopted instead of the old one. The writer has never tried this process, but feels confident that an error is involved in the use of sulphuric acid and copper. It is, however, much more certain that a grave error has been made by the committee in the quantity of stronger alcohol taken, and the quantity of the resulting product. Had the committee copied their authority more literally, they would have escaped the great blunder of making seven or eight pints of the spirit from "four troy ounces and a half" of nitric acid. These proportions yield a preparation of about one-fourth the strength it should be, and must be, in order to answer the requirements of their note of tests. The writer having made thousands of pounds of this preparation with great success by the old formula, and repeatedly upon the scale of the Pharmacopœia, is at a loss for any reason for this change in this important preparation.

In the formula for suppositories of lead and opium, the oil of theobroma is left out, p. 287.

Heat is still very mistakenly insisted upon in the process for syrup of iodide of iron, p. 291.

Tincture of aconite leaf is dismissed, though called for perhaps quite as often as many of the articles introduced, while it must necessarily be kept by the pharmacist, to fill those prescriptions which call simply for tincture of aconite.

Notwithstanding all that has been written at home and abroad, the committee seem to be only one-quarter converted to the advantages of the dried, unripe fruit of conium over the leaf. They advance so far as to admit the fruit, and make the fluid extract from it; but still make the extract, alcoholic extract, p. 138, and the tincture, p. 307, from the leaf; and besides, introduce a bad new preparation, juice of conium, which they alſo make from the leaf. Why they refuse such authority as Dr. John Harley, of London, especially as it is supported by abundant testimony at home, your reporter cannot understand.

In the troches of bicarbonate of soda, nutmeg is found in the formula, but not in the process. Which is in error?

In a new preparation, ointment of cantharides, introduced at p. 328, is a curious instance of novelty. Two cerates are mixed, and called by the committee an ointment. How the mixing can change and reduce the consistence, as implied in the name, is difficult to understand.

The old defective process for acetate of zinc is abandoned, and a good process is adopted in its stead.

The tables usually found at the end of the preparation, giving a summary account of all the changes made, are increased in number by one; and six new tables of weights and measures have been added. These give the officinal and metrical systems, and their common and most useful relations to each other, and their approximate equivalent values. In giving the value of the gramme in grains, the latter and more correct determination is not accepted by the committee. The equivalent given by Gmelin, "Handbook," p. ix., from authorities from that date, is 15.44242 grains. This determination was subsequently corrected to 15.4346, and again to 15.4340 as given in the U. S. Dispensatory. But the value generally accepted at this time, as the result of greater precision in the weighings, is 15.4322 grains, as determined by U. S. authority in the Bureau of Hydrography in Washington. The new Pharmacopœia gives 15.434.

The convention of 1860 directed that the Index of the Pharmacopœia should "have its name so marked for the quantity of the syllables that it may serve as a pronouncing vocabulary of the materia medica." This was well done by the former committee, and your reporter can attest the utility of such a standard for reference, to correct the many common errors of pronunciation against which this provision was made. It is to be regretted that the present committee did not allow this index to stand, even with its very few doubtful renderings. At the present revision, the index is merely accented, thus leaving the *e* and *ch* to be rendered either hard or soft though the *g* is marked, and leaving the vowels entirely unmarked for quantity.

In a retrospective view of the materia medica for the past decade, it will be seen that the number of articles proposed and used, and the voluminous and inconsistent testimony in regard to them, are unprecedented; and hence it must appear, to the most casual observer, that the work of the committee in selecting articles for admission was unusually difficult and laborious. This difficult work the committee has accomplished with a judgment so generally good that exceptional instances become the more conspicuous. As an instance of this exceptional character, they introduce the hypophosphites, now pretty well worn out, and pretty generally rejected, though still possibly entitled to the place; but reject pepsin, which stands so very much in need of a pharmacopœial description and tests.

Your reporter here gives up the disagreeable and tedious labor of having so much of this important national standard to object to. It is a work at which he hesitated and halted, and it never would have been undertaken but from a sense of paramount duty. He therefore begs a few words of personal explanation in concluding the disagreeable task.

Let no man infer from what has been here written that the writer places himself in an attitude of hostility to the United States Pharmacopœia; or that he in any degree withdraws any part of the influence he may be able to exert from earnestly supporting it. On the contrary, if he knows his own position in the matter, it is that of unchanged, honest, earnest fidelity to the National Standard, and unchanged disposition to work for its improvement.—*New York Medical Journal.*

COMPLETE ANALYSIS OF CINCHONA BARKS.

BY P. CARLES.

The immediate analysis of cinchona barks has already been partly made by Pelletier and Caventou. Those chemists found in each species, among other products, quinine, quinovic and cinchotannic acids, coloring matter, fats, gum, starch, etc. Besides these I have found sugar, or rather glucose, the presence of which did not appear to be normal, but seemed to proceed from the splitting up of the cinchotannic acid, which is rather a glucoside than a true acid. Analysis has in fact shown that glucose is more abundant in the external layers of the bark, which have also been found to be more rich in the tannin principle.

There exists yet another element in cinchona, namely, ammonia, which I have carefully investigated, although its presence had been previously announced by Fourcroy, Reichel, Howard and De Vry; for I thought it might furnish a glimpse of the truth as to the genesis of quinine and chinchonine. I also sought whether any relations existed between the proportions of this alkali and those of the vegetable alkalies. I therefore operated upon the three types of pharmaceutical species of bark, of which the proportions of alkaloids were already known, the huanuco, succirubra and calisaya barks. In order to make the results more conclusive, experiments were made with the entire bark, and with the various layers of the same bark separated. The ammonia was removed in the cold, and estimated according to Schloesing's method. One hundred parts of bark yielded—

	Entire bark.	External layer.	Intermediate layer.	Internal layer.
Succirubra	traces	traces	traces	traces.
Calisaya	0.016	0.012	0.012	0.016
Huanuco	0.048	0.049	„	0.028
Calisaya leaves	0.061	„	„	„

This table shows that the barks richest in alkaloids are least charged with ammoniacal salts. The relation between the quantities of those salts existing in the external and internal layers is not constant. The only conclusion which can be drawn is that the organs which contain the most ammonia are the richest in tannin and the youngest, provided, however, that the grey cinchonas are the younger branches from the same trees as produce the yellow bark. However this may be, the leaves contain a much more notable proportion of the volatile alkali, whilst they rarely yield any traces of the alkaloids.

Analysis of the Ash.—Another point in the history of cinchonas that appears to have been neglected is the analysis of the ash. This would appear to be important, because most of these mineral principles pass into the greater part of the preparations of cinchona, carrying with them their characteristic action, which is thus added to those of the organic principles, and also because of the part they play in the growth of the cinchona plant. The effects of temperature, altitude, and the action of light upon the growth of the plant have been studied, but the nature of the soil, and the improvements which may be made in it, have hitherto been somewhat neglected. The study of the ash might enlighten the cultivator upon this point and lead to the collection of a richer product.

Three officinal species of cinchona barks were chosen for experiments: the grey huanuco, the yellow calisaya, and the red succirubra, two specimens of each species being used for greater certainty. The results were obtained in each case with from 4 to 6 grams of ash arising from the combustion of 300 or 400 grams of bark. The quantities of ash indicated in the following table are the residues of 100 grams of cinchona.

	Huanuco Bark.		Calisaya Bark.		Succirubra Bark.	
Ash	1.831	1.885	1.350	1.361	1.402	1.741.
Insoluble Silica	0.263	0.241	0.023	0.032	0.020	0.031.
Soluble Silica	0.041	0.047	0.024	0.031	0.025	0.018.
Alumina	0.061	0.050	0.030	0.020	0.062	0.052.
Iron	0.061	0.042	0.065	0.049	0.053	0.070.
Manganese	0.048	0.026	0.027	0.032	0.042	0.025.
Lime	0.376	0.383	0.382	0.379	0.546	0.720.
Magnesia	0.034	0.034	0.016	0.031	0.021	0.018.
Potash	0.429	0.540	0.340	0.252	0.215	0.298.
Soda	0.081	0.069	0.041	0.052	0.048	0.034.
Copper	traces	traces	traces	traces	traces	traces.
Carbonic acid	0.309	0.318	0.338	0.345	0.280	0.291.
Sulphuric acid	0.207	0.034	0.036	0.038	0.035	0.034.
Phosphoric acid	0.074	0.053	0.048	0.067	0.045	0.042.
Chlorine	0.015	0.009	0.008	0.010	0.014	0.012.

A glance at this table will show that iron, manganese, and lime (united with the phosphoric acid), are present in notable proportions. These various principles are, it should be remarked, found in the infusions, decoctions, extracts and wines of cinchona, where their presence by the side of tannin and the salts of quinine is not a matter of indifference. In order to detect the copper, it is necessary to ignite the carbon as completely as possible, and it is advisable to carry on the operation in the muffle of a cupell furnace. The proportion of copper is so small that there is no fear of its poisonous effects. M. Sarzeaud estimated that cinchona contained one-five-hundred-thousandth part.

Considering the statement long since made by Fourcroy, that cinchona barks were rich in chlorides, the proportion of chlorine given in the above table might appear small, but probably his experiments were made with specimens which had been injured in their transport.

It has also been said that the barks richest in quinine were generally those which abounded in lime salts. The foregoing figures tend to demonstrate the contrary, for the proportion of lime is the same in huanuco and calisaya barks and higher in the succirubra.—*Phar. Jour. and Transactions.*

EMULSIONS.

BY HERBERT G. ROGERSON.

The appearance in a recent number of this journal of a paper bearing the above title, transcribed from the *New York Druggists' Circular*, leads me to offer a remark or two on the same subject.

The paper referred to was mainly devoted to a consideration of the merits of a combination of gum acacia and glycerine, in the preparation of emulsions of various kinds. Believing, however, that gum tragacanth affords us a mucilage which, when prepared under certain conditions, is capable of giving results in every respect superior to any producible by the combination recommended in the paper, I propose briefly to outline its more advantageous applications, and extremely convenient method of preparation. In doing this I am led to recur to a formula sent by me to this journal some three years ago, and published under the title of "Cod Liver Oil Cream," which may be taken as a type of this class of emulsions; and the fact of the extensive and successful adoption of that formula having come to my knowledge, emboldens me to reproduce it in a slightly modified and improved form.

Before doing so, however, I may state it as a *sine quâ non*, that the tragacanth employed for this and allied preparations should be of exceptionally fine quality. It should possess a pretty uniform whiteness, and freedom from dark patches and specks, or if these latter be present they should be broken off and rejected. The selected pieces are then cut up into fragments about one quarter of an inch square, and immersed in soft or distilled water for 48 or more hours in the proportion of about 2½ oz. to the gallon,stirring at intervals to prevent agglomeration. The addition afterwards of a small percentage of glycerine ensures almost indefinite keeping qualities. To avoid disappointment and secure the best results, it will be well not to rely on any ordinary sample of the gum, but to apply to one's wholesale house for a small parcel of exceptional quality. In this way we succeeded in obtaining a sample almost free from blemish, and requiring no material weeding; while but for this precaution one might improve but slightly on the pharmacopœial mucil. tragac., a dark and muddy product.

The formula referred to above, as amended, runs thus :

℞	Ol. Jecor. Aselli - - -	℥ v.
First shake together.	Ess. Limon	
	" Amygd. (1 in 16) aa *m* xxiv.	
	Spts. Vini Rect. - - -	℥ iss.
	Syrup - - - - -	℥ ss.
	Mucil. Tragac. (prepared as above) ad - - -	℥ xvi.

The mere act of shaking together these ingredients for an instant or two suffices to unite them into an elegant semi-transparent, and permanent emulsion, with attractive custard-like flavor that can scarcely fail to commend itself to the votaries of "Elegant Pharmacy."

Other oils, as castor, almond, turpentine, etc., or balsams may be substituted for the one above specified. The proportion there given may be held to be only *relative*, the precise quantity of any oil, "emulsifiable" by a given quantity of mucilage depending directly upon the degree of viscosity of the latter. If it be desired to combine an oil in much larger proportion than appears in the formula given, this may be effected to an almost incredible extent by substituting brisk stirring in a mortar during the adding of an oil, for the mere agitation that sufficed in the former case. It is probable that a great variety of substances upon which I have not yet experimented may be treated advantageously as above.

My experience has been mainly with the oils of castor, cod-liver, olive and turpentine, and the success attending the use of these was perfect, none of them showing any disposition to separate after many months keeping, and retaining then a degree of sweetness and freshness that proved keeping qualities of a very perfect order.—*Phar. Jour. and Transactions.*

LABORATORY NOTES.

BY S. P. SHARPLES, STATE ASSAYER.

THE ANALYSIS OF COMMERCIAL PHOSPHATES.

In a report on commercial manures it is generally only necessary to give the phosphoric acid, soluble, insoluble, and reverted, and the amount of nitrogen, but if these alone are given, the purchaser is but rarely satisfied; or, as the manufacturers say, the farmers want to know "what the rest is." It is therefore customary to give the calculated equivalents in phosphate of lime, of the various forms of phosphoric acid present; also the amount of organic matter, water, sand, etc.; and by a little ingenuity displayed in these calculations, a very fair aspect may be put upon an otherwise rather inferior manure. It is much to be desired that chemists should adopt some uniform method of stating their results. The one we give below is approximately the one followed by Professor Johnson and other eminent chemists, and if all reports were made upon this plan it would save much labor in comparing analysis.

We prefer, in stating the amount of water, to put it under the two heads of moisture expelled at 100° C., and water expelled at 160° C. The latter is essential to the superphosphate, and cannot be driven off without converting the soluble phosphoric acid into insoluble; the former may be brought within very narrow limits, and should not exceed three or four per cent.

The amount of organic matter in a superphosphate is very difficult to determine on account of the fact, which seems to be overlooked in most of the text-books, that sulphuric acid is driven off from sulphate of lime by the free phosphoric acid in the superphosphate, at a low red heat. The loss on igniting the phosphate previously dried at 180° does not, therefore, truly represent the amount of organic matter contained in the material, but represents the amount of organic matter plus almost the entire amount of sulphuric acid originally employed to render the phosphate of lime soluble. Only that amount of sulphuric acid remains which is combined with the lime that existed in the original material as carbonate.

The organic matter may be roughly estimated by taking two or three grams of the phosphate in a platinum dish and adding to it, first, enough water to form a thin paste, and then milk of lime to slight alkaline reaction. The mass is then to be evaporated to dryness on the water bath, and then dried at 160° C. until it ceases to lose weight. It is then ignited at a low red heat. The loss of weight represents very nearly the amount of organic matter present.

In making analysis of fertilizers it is well to take two portions of ten grams each. The first of these is treated with small portions of cold water in a common porcelain mortar, each separate addition of water being allowed to stand until it becomes almost clear. It is then poured upon a filter, which is supported by a funnel resting in the neck of a litre flask; ten or fifteen portions of about fifty centimeters each should be added: the residue is then transferred to the filter and washed with cold water until the flask is filled to the mark. This solution we will designate *A*. The funnel is then removed, with the filter still upon it, to a filter stand, and the residue is thoroughly washed with ammonic citrate, and afterwards with hot water, until the last traces of the ammonia salt are removed. The residue of this operation is dried, ignited, and dissolved in hydrochloric acid, filtrated from the insoluble part, and the solution made up to one litre. We call this solution *B*. The second portion of ten grams is then dissolved directly in hydrochloric acid, evaporated to dryness to render the silica insoluble, redissolved, and filtered. The filter and contents, when ignited, give the amount of sand and other insoluble material contained in the ten grams. The filtrate is made up to a litre by the addition of water: call this *C*. We now have three solutions, each of known strength. *A* contains all the soluble phosphoric acid; *B* contains all the insoluble phosphoric acid; and *C* contains the total amount of phosphoric acid. The amount in each of these solutions may be determined by means of a graduated solution of uranic nitrate. If great accuracy is desired, the ferric and aluminic phosphates may be removed by boiling the solution of phosphate with sodic acetate previous to titration. This, however, is but rarely necessary in the commercial fertilizers for sale in the North; those made from Carolina phosphates may need this precaution. The sum of the phosphoric acid found in *A* and *B*, when subtracted from that found in *C*, will give the amount of reverted. We have found it convenient to have the uranium solution graduated so that each cubic centimeter corresponds to five milligrams of phosphoric acid. Each c. c. of uranium solution will then equal one half of one per cent. of phosphoric acid, if 100 c. c. of the solution to be tested is taken for the analysis.

The above method of estimating phosphoric acid is well known not to be strictly accurate from a variety of causes; yet when used skilfully it will generally give within one half of one per cent. of the amount of phosphoric acid present, which is near enough for all commercial purposes, as it is hardly practicable not to have a much wider variation than this in any two samples selected from the same lot of phosphates.

The solution *C* also serves for the determination of the sulphuric acid, lime soda, potassa, and other bases, a hundred c. c. being taken for each determination. For the determination of the nitrogen, Will and Varrentrap's method, as modified by Professor Johnson, is the most convenient. If, however, nitrates are present, an absolute determination of nitrogen must be made; for this we prefer the use of the Sprengle air-pump, as suggested by Dr. W. Gibbs.

STATEMENT OF ANALYSIS.

Moisture expelled at 100 C. - - - - - -		00.00
Water expelled at 100 C - - - - - - -		00.00
*Organic and volatile matter - - - - - -		00.00
Phosphoric acid (P_2O_5) soluble - - -	00.00	
Equivalent to phosphate of lime $Ca\ P_2O_6$ - -		00.00
Phosphoric acid (P_2O_5) reverted - -	00.00	
Equivalent to phosphate of lime $Ca_2P_2O_7$ - -		00.00
Phosphoric acid (P_2O_5) insoluble - -	00.00	
Equivalent to phosphate of lime $Ca_3P_2O_8$ - -		00.00
Phosphates of iron and alumina - - - - -		0.00
Sulphate of lime (gypsum) - - - - - -		00.00
Sand - - - - - - - - - -		0.00
Potassa - - - - - - - - - -		0.00
Soda, loss, etc. - - - - - - - - -		0.00
		100.00

*Contains nitrogen 0.00 per cent.

We prefer to give the phosphates of lime as anhydrous, because we find that this formula is generally the one most acceptable to those desiring the analysis made.—*Boston Journal of Chemistry.*

Nitrate of Bismuth for the Removal of Carbon from Ash.—In order to burn the ash of substances in which the last trace of carbon is very difficult to drive off, Bechamp employs nitrate of bismuth. The substance is placed in a porcelain dish; a known quantity of a titrated solution of nitrate of bismuth is added. If after one ignition the ash is not white, then some nitric acid is added, and the dish is again heated. The weight of the residue, minus the weight of the oxide of bismuth in the nitrate added, gives the weight of the ash. It is not necessary to add more than a few per cent. of the nitrate. If after treatment with the nitrate of bismuth it is desired to estimate the phosphoric acid, this may be done directly by adding dilute nitric acid to the residue, phosphate of bismuth being insoluble in this menstruum —*Ibid.*

The Kitchen Stove in the Laboratory.—Any one who has ever used a common cooking stove in a laboratory will never again willingly dispense with it. The first person that we ever saw using one was Dr. Gibbs In his laboratory at Cambridge, where it was often an object of great amusement to his visitors. It serves most of the purposes of a sand bath without the annoyance of the sand. A flask of water placed upon it will boil in a few minutes, and we are thus always enabled to keep our wash bottle hot. There is far less danger of breaking the flask than when it is heated in the ordinary way over the sand bath, or on wire gauze, as there is no moisture to condense and run down upon the outside of the flask. Care must be taken, however, to wipe the flask dry before setting it upon the stove.

If for any purpose we require a sand bath, it is easily made by partially filling an iron pot with sand and placing the pit on the stove. We can regulate the heat by putting it upon the back or front of the stove. Water baths are conveniently furnished by the tea-kettle or larger kettles, according to circumstances. The oven affords a ready means of drying precipitates, and if the doors are left open there will be but little danger of burning them; while if we wish a heat of one hundred and fifty or two hundred degrees Centigrade, it is easily obtained by shutting the doors. A small still set on one corner will furnish all the distilled water that is needed in a laboratory where not more than two or three are working, by running it one or two days in the week. And further, if there is a good draft we can easily melt a pound or two of any metal that has a lower melting point than silver, by placing the crucible in the fire. We are perhaps somewhat enthusiastic on the subject of a cooking stove, but we have just got possesion of one again after doing without a year or two, and we know how to appreciate it.—*Boston Journal of Chemistry.*

FERROUS MANNATE.

BY M. GHYSEN.

The author has reported to the Medical Society of Liege the result of some experiments he has made to obtain a preparation of iron in the ferrous state which could be kept without undergoing change, and in which he used manna as a preservative agent. The method adopted was as follows: 75 grams of pure crystallized sulphate of iron was pulverized and mixed intimately with 100 grams of manna in tears. 80 grams of solution of ammonia (sp. gr. .905) was then added, and the mass rubbed up so as to obtain a thoroughly homogeneous mixture. To this was added, a little at a time, 130 grams of alcohol (94°), which mixture separated clearly into a soft mass and a supernatant ammoniacal liquid that was rejected. The residue was again washed with 130 grams of fresh alcohol, and the product afterwards dried quickly and pulverized. The liquors rejected weighed together 310 grams. The quantity of ferrous mannate so produced consisted of 125 grams of a beautiful green powder, entirely unalterable in the air. The powder, suspended in water, colored it green without dissolving, and the liquor passed through a filter colorless. Nevertheless, directly the iron entered into solution it oxidized with great rapidity, turning the liquor yellow, and showing that water acts injuriously by causing the iron to pass into the higher state.

Ammonia was used in preference to potash or soda, in order easily to eliminate by evaporation the excess of alkali, and so obtain a product composed entirely of manna and iron. As a ferruginous preparation, M. Ghysen believes the mannate, in regard to the quantity of active principle it contains, to be one of the richest. It may be administered in powder, in doses of from a few centigrams to a gram, or in pills. The following formula he has found to yield a good result:

Ferrous Manate, in powder, - - - -	10 grams.
Water, - - - - - - - -	150 "

Make into pills of 20 centigrams.

He states that the mass is hard, but may be rolled and divided with facility, while the pills keep perfectly without being coated.—*Phar. Jour. and Trans.*

SELECT FORMULÆ.

Compound Arsenical Paper.—The following is transcribed from the Receipt Book of the Philadelphia Hospital:—

℞	Belladonna leaves - - - - - -	- grs. xcvj.
	Hyoscyamus " - - - - - -	
	Stramonium " - - - - ' -	aa grs. xiviij.
	Ext. opium - - - - - - -	grs. iv.
	Tobacco - - - - - - -	- grs. lxxx.
Add		
	Potass. nit - - - - - - -	grs. cxx.
	Potass. arsenit - - - - - -	grs. cccxx.

Take thick bibulous paper; soak it in this solution, and allow to dry. When set on fire and the flame extinguished, this paper burns slowly without flame, and emits a dense smoke which may be inhaled for the relief of asthma, often with very marked benefit. It is also useful in chronic bronchitis.

For Excessive Perspiration of Hands or Feet.—A German pharmaceutical journal recommends the following:—

℞	Carbolic acid	1 part.
	Burnt alum	4 parts.
	Starch	200 parts.
	French chalk	50 parts.
	Oil of lemon	2 parts.

Make a fine powder, to be applied to the hands and feet, or to be sprinkled inside of the gloves or stockings.

Salve for the Lips, etc.—The following is used for excoriations, warts, and cracks, superficial ulcerations of the lips, mucous membrane of the cheeks, red parts of margin of nose, and other parts of the skin which are normally red:—

℞	Ammoniated mercury	gr. vj.
	Carmine	gr. i.
	Soft cerate	dr. ij.

Mix exactly.

The parts should be dried before the salve is applied.

New Anodyne Colloid.—The London *Practitioner* gives the following formula as "likely to prove a useful application in neuralgic and other localized pains:"—

℞	Amyl. hydrid	℥ j.
	Collodion (B. P.)	℥ j.
	Aconitiæ	gr. i.
	Veratriæ	gr. vj.

This forms a colloid which should be brushed over the painful part five or six times, forming successive films. If the pain be not at once relieved, the absorption of the alkaloids may be favored by covering the colloid film with a layer of spongio-piline.

For Chilblains.—*L'Union Medicale* recommends the following application:—

℞	Oxide of zinc	2 parts.
	Tannic Acid	1 part.
	Glycerine	10 parts.
	Balsam of Peru	8 parts.
	Camphor	4 " M.

—*Boston Journal of Chemistry.*

EDITORIAL DEPARTMENT.

NOTICE.

The undersigned hereby announces his retirement from the editorial control of this journal—a retirement which has been rendered imperative by the constantly increasing business and professional engagements which have for some time past demanded his entire energies for fulfilment. Under such circumstances the readers of this journal will not be surprised to learn that the resignation of the editor was handed in many months ago, and has at length, though tardily, been accepted by the publishing committee.

Having been identified with the interests of THE PHARMACIST for upwards of three years, with relations of the most gratifying character between both readers and publishers, it could not be otherwise than that the retiring editor should view the future prosperity of this journal with peculiar regard. It is with pleasure, therefore, that he announces that Professor Albert E. Ebert will assume control of these pages from this issue.

In severing official connection with THE PHARMACIST, it is needless to say that the editor does so with the intention of aiding it, as a contributor to its pages, and otherwise, to the fullest possible extent.

N. GRAY BARTLETT.

The office of this journal will hereafter be at the College of Pharmacy, 77 Dearborn Street, room No. 32. Mr. N. W. King, who has been engaged as *Business Editor*, will devote his entire time and attention to the business interests of THE PHARMACIST, and may be found at the rooms daily (Sundays excepted), between the hours of 10 and 12 A. M., and 2 and 4 P. M. Parties having business with this journal will find this arrangement very convenient, and members of the College, or others, will be greatly accommodated, as, during the hours mentioned, they may have access to the library of the College.

BOOKS RECEIVED.

Manual of Chemical Analysis as applied to the examination of Medicinal Chemicals. A guide for the Determination of the Identity and Quality, and for the Detection of Impurities and Adulterations. For the use of Pharmaceutists, Physicians, Druggists and Manufacturing Chemists, and Pharmaceutical and Medical Students. By Frederick Hoffman, Ph. D., Pharmaceutist in New York. D. Appleton & Co., New York, 1873.

Under this comprehensive title we have a volume which will be cordially welcomed by every pharmaceutist, and by all others to whom it is especially addressed. A work of this character has long been a desideratum, and we may now truly say that the void has been well filled by the excellent treatise under notice. Dr. Hoffman treats first of manipulations and reagents, then of qualitative and volumetric analysis, and, finally, proceeds with the methods of determining the identity and quality of medicinal chemicals. In all these departments of his work, the author displays extended research, and a critical familiarity with his subject, whilst at the same time he has placed the matter before the reader with system and in anguage at once clear and concise. Not only is the author to be congratulated upon the excellent result of his labor, but every pharmacist, also, upon this most opportune addition to the literature of his art, and most valuable assistant in his daily work.

OBITUARY.

JUSTUS LIEBIG.

Died, on the 18th of April, at Munich, Baron von Liebig, in the seventieth year of his age. This illustrious chemist was born at Darmstadt, May 12, 1803. He studied physical sciences at Bonn, Erlangen and Paris, and in 1824 prepared a paper on Fulminic Acid, which won him the patronage of Humboldt, who procured him an appointment to a Professorship at Giessen. In 1852 he was made a Professor at Munich. His principal works are, "Annalen der Chemie und Pharmacie," portions of "The Handbook of Chemistry," and "Organic Chemistry in its Applications to Agriculture." His most popular work was his "Familiar Letters on Chemistry," which has been translated into the language of almost every civilized nation.

CORRESPONDENCE.

Mr. Editor: Thinking an exchange of experience by druggists, through your valuable journal, would have the effect of correcting a great many of the growing evils in our profession, I will mention one of the annoyances that I find on the increase; that is, prescriptions presented "copied by inexperienced persons." They know nothing about the article they copy, but simply try to copy the letters to form a word, and very often make a mistake in a letter, which changes a harmless article into one extremely dangerous in the manner proposed to be used. The apothecary being always anxious to prepare everything presented, often has to stretch his imagination as to what is wanted, and in some cases it works well, and in others does no good, if no harm, and the reputation of our nearest friend, the physician, is thereby injured. It is getting quite common for persons to apply to a physician, get a prescription, go to the druggist, get it prepared, and ask that the original prescription be returned to them, and according to the present custom it must be done. If the medicine has the desired effect, they give a copy to their neighbor, and it is astonishing how distorted it soon becomes after several copies have been given, one after the other; it gets so mixed that the physician who was its author would never recognize it, and then it has to be given up by the conscientious druggist, and returned to the party seeking its preparation with the explanation that it cannot be understood. Now, an experienced apothecary does not like the idea of returning a prescription, saying he cannot understand it. But if he is an honest man he must do so. He is placed in an embarrassing position before the public, because the prescription is taken down street to the patent medicine druggist, who accurately dispenses prescriptions, family receipts, &c., and he prepares it by omitting or substituting what he cannot understand, thereby attempting to create in the minds of the public that he can supply anything.

I will give an instance of how it is sometimes managed. A customer came to me and wanted a mixture prepared as he dictated; this I reluctantly commenced, and after putting into his bottle one or two articles, he called for a quantity of "tin can;" not having any tin can in shape to put into his bottle, I suggested that he might be mistaken; but he insisted he was correct, as he copied it himself from the doctor's prescription, and that he had it just as it was written. After some persuasion, he concluded to get the original, and upon the first glance I found it "Tinct. Canth.," not very plainly written, but the party copying it was sure it was "tin can."

The question as to whom the prescription belongs, after being prepared has often been discussed, and I am decidedly of the opinion that it is the property of the druggist who fills it, and should no more be given back to the party presenting it than if a person should bring an order for a bottle of quinia, and want the order returned with the article. If there could be a correct understanding among druggists and physicians in this matter, it would result in their mutual benefit. The growing habit of copying physicians' prescriptions could be remedied by having the proper custodian of the prescription understood. These hard times, a great many consider they are doing good service by letting their neighbor copy their prescriptions, saving the physician's charge; but if they were prepared as they copy, it would often be very dear economy. Any druggist can see how easy it is for an inexperienced person to mistake an ℥ for a ʒ, and if the prescription so copied falls into ignorant hands to be prepared, an overdose is not noticed. I propose that all regular apothecaries refuse these so-called copies of physicians' prescriptions, thereby saving themselves a great deal of trouble and annoyance, and uniting them more closely to their inseparable companion—the physician. I. B. A.

The Alumni Association of the College of Pharmacy of the City of New York held their annual meeting on Thursday evening, April 3d., when twenty-five new members were elected. President Robbins read his Annual Address, giving a brief review of the progress of the College and of the profession generally during the past year. Papers were read by Mr. J. L. A. Creuse, on a "New Series of Tasteless Iron Combinations," and by Mr. B. F. McIntyre, on the "Fluid Extract Ipecac of the new Pharmacopœia."

The following officers were elected: *President*, D. C. Robbins; *Vice Presidents*, G. C. Close, O. C. Winmann, H. Osborne; *Treasurer*, Theobold Frohwein; *Secretary*, T. F. Main; *Executive Board*, B. F. McIntyre, G. W. C. Phillips, J. Vanderburgh, J. L. A. Creuse, L. M. Rice, P. W. Bedford; *Delegates to the Meeting of the American Pharmaceutical Association*, L. M. Rice, H. C. Porter, Edwin Henes, P. W. Bedford, H. Osborne.

The resident members of the association will hold quarterly meetings for the discussion of subjects of interest to the Profession.

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CONCENTRATED COMPOUND INFUSION OF GENTIAN.

BY R. ROTHER.

The compound infusion of gentian of the Pharmacopœia is an elegant preparation. It differs from most other infusions in containing a small proportion of alcohol to preserve it. However, no less than three well sustained objections can be brought against it. So useful and appropriate a compound should receive the full measure of appreciation that its importance demands. Therefore its completeness in every particular should be properly considered and timely effected. The writer takes occasion to speak more emphatically in behalf of this preparation, on account of the monstrous proportions which the elixir pharmacy has attained. If the compound infusion of gentian could at once receive its proper recognition at the hands of the physicians, the skirmish line of the elixir raiders might be immediately and permanently checked. This preparation is so constituted that the most, if not all, the ingredients usually exhibited in elixirs could be very easily prescribed by the physician in it direct, without at all finding it necessary to partake of the cheap advice of the ever ready and officious lackey, in the capacity of the elixir vendor. The compound infusion of gentian is in itself an excellent stomachic and mild tonic; other tonics are easily incorporated and always compatible, and innumerable other remedies may be combined with it. The absence of sweetening in this preparation is a feature which in case of great popularity will prevent an abuse of the remedy. But should the physician desire it, this can on all occasions be introduced. There will be invariable uniformity in the preparation, because the formula is officinal, and if this be constructed intelligently, and be practical, it will ever command the universal respect of enlightened pharmaceutists.

The writer will first allude to the necessity of a more concentrated form, not for the use of the physician so much as for the convenience of the pharmaceutist. The complete infusion is too bulky to be kept in stock, and as the writer will presently show, not precisely suitable for the purpose for which it is now put forth. The method of preparing it properly is evolved from a concentration. The ingredients, especially when treated in quantity, are much more easily exhausted by treatment with a moderately strong alcoholic menstruum; as, for instance, equal measures of strong alcohol and water. The writer has long employed a concentrated infusion eight times the officinal strength, for the purpose of keeping the necessary quantity in stock, and avoid the cumbrous bulk of the officinal form. However, for immediate dispensing use the octuple form is first reduced to a quadruple strength by mixing equal measures of the extra concentration and diluted alcohol, to form the ordinary strength of the concentrated infusion for the dispensing department. This latter form is simply mixed with three times its volume of water to produce the strictly officinal compound infusion of gentian. Therefore the pharmacopœia should give two formulas for this preparation, and the second one should be constructed as above indicated.

Now, secondly, the writer would again remark upon the impropriety of employing the dried orange peel as an aromatic. The writer has expressed himself to that effect already on a previous occasion. The dried peel should by no means be used, as it seriously detracts from the quality of the aromatic ingredients. The moist, fresh rind should alone be admitted where the presence of orange peel is denoted. To utilize this material properly, the writer prepares with the bruised peel an exquisite aromatic tincture by macerating two troy ounces of it with one pint of a mixture composed of equal parts of strong alcohol and water. After a sufficient period of maceration, the tincture is filtered from the residue, or when used for preparing the concentrated infusion, the remaining solids are reduced to a required fineness, moistened with a part of the tincture, and then packed into a suitable percolator. After this the tincture, together with the suspended orange peel, is poured on, and this followed by diluted alcohol until the required measure of percolate is obtained.

Thirdly, the writer does not consider the coriander as good an aromatic as should be used for this infusion. The officinal aromatic combination is by no means good. Caraway would be much more pleasant and appropriate, but either of them is rather too intense for the orange peel, nevertheless the aromatic should be modified in favor of caraway.

The writer will now show of what utility the concentrated infusion is to the dispenser. But since strychnia, citrate of iron and strychnia, citrate of iron, citrate of iron and quinia, pyrophosphate of iron, and ammonio citrate of bismuth are largely prescribed with this infusion, the work is much facilitated and great accuracy is attained by having these substances on hand in concentrated solutions, which, however, must invariably be of a permanent character in themselves. The writer will here particularly mention the highly useful solution of strychnia, known as Hall's solution of strychnia. This preparation is simply an aqueous solution of acetate of strychnia in the proportion of one grain of pure strychnia to the fluid ounce. It is made by mixing eight drops of acetic acid with a fluid ounce of water, dissolving eight grains of pure strychnia in this, with the aid of a gentle heat, and then diluting the solution with water to the measure of eight fluid ounces.

Now, supposing all these preliminaries are arranged and a physician prescribes as follows:

℞ Strychniæ, gr. i.
Infusi Gentianae Comp., f ℥ iv.
Syrupi, f ℥ ij.
Misce et fiat sol.

We proceed by measuring first, one fluid ounce of Hall's solution of strychnia, then one fluid ounce of concentrated infusion of gentian, after that two fluid ounces of syrup, and finally water to measure six fluid ounces, and mix the whole.

Now, should the physician write:

℞ Strychniae, gr. i.
Ferri citratis, ʒ ij.
Infusi Gentianae Comp., f ℥ iv.
Misce et fiat solutio.

We again measure one fluid ounce of Hall's solution, half a fluid ounce of solution of citrate of iron, one fluid ounce of concentrated infusion of gentian and water to measure four fluid ounces.

All other modifications are treated according to the principles above indicated.

The following is the process for concentrated compound infusion of gentian, for making the officinal infusion:

Take of Gentian in 40 powder,	16	troy	ounces.
Coriander, " "	4	"	"
Moist fresh Orange Peel,	8	"	"
Strong alcohol.			
Water of each sufficient.			

Bruise the orange peel to a pulp, or cut it into small pieces and macerate it for 6 or 8 days in four pints of a mixture composed of equal measures of strong alcohol and water. Then moisten the gentian and coriander with three or four fluid ounces of this tincture and pack the mixture moderately firm into a cylindrical glass percolator having the perforated diaphragm covered with tow, so as to form a medium low column. Then pour on the rest of the tincture, together with the suspended orange peel, and afterwards diluted alcohol, until eight pints of percolate has slowly passed; or the percolation, if carefully conducted, need only be carried to four pints of percolate, and the octuple strength obtained as above described. With eight pints of percolate the preparation is the quadruple strength of the officinal, or what the writer terms normal concentrated compound infusion of gentian, which requires the addition of thrice its volume of water to bring it down to the officinal form. With four pints the preparation is further adjusted as above explained.

TRIHYDRIC PHOSPHATE.

BY R. ROTHER.

Metaphosphoric acid, when in aqueous solution, is slowly changed into the tribasic state at the ordinary temperature, but much more rapidly at a boiling heat. This change is moreover accelerated in the presence of a small quantity of some other acid. For the preparation of the medicinal diluted acid, the aid of nitric acid is preferred. The proportion of this, as well as the water used, is beyond all necessity many times too great when operating with moderately large quantities. It is rather the duration of heat supported by a trifling proportion of the other acid, than a large amount of this. The effect of the foreign acid can hardly be termed catalytic. It can be assumed, for instance, that if a certain length of time is required to convert one ounce of the monobasic acid into the tribasic, 16 ounces will require no longer; for the whole quantity in each case suffers the same amount of heat for the same length of time. Now, if in the second case, the other acid and also the water were increased 16 times, then a most unnecessarily, in-proportionate quantity of these must subsequently be expelled, giving thereby a prolongation of the process far beyond the limits really requisite for its completion. After the acid has been converted into the other condition, all the time and fuel consumed in evaporating the surplus of water and nitric acid is simply wasted. It is highly presumable that the orthophosphoric acid itself has an action identical to that of nitric acid, or any other acid applicable. The proportion of acid and water added should be such that when the resulting trihydric phosphate has received its appropriate concentration, simultaneously with it the whole excess of water and nitric acid will be evaporated, and the hydric metaphosphate have ceased to exist. During the evaporation in this process the conversion continually goes on, and the volume of water need therefore be but comparatively small, not over twice the weight of the acid first used. The nitric acid is not dissipated until the solution is much condensed, and it is only after most of the water has fled that the nitric acid is volatilized.

The writer has found a concentrated syrupy solution of the trihydric phosphate exceedingly serviceable. It dispenses with the large volume of the diluted acid, and is frequently employed in a concentrated state. The writer now makes it of such a strength that one troy ounce of the hydric metaphosphate is represented in a fluid ounce of the syrupy acid. The liquid is conveniently thin and nearly as concentrated as the liquid form will permit, without reconversion into the monobasic condition. Eight troy ounces of the glacial acid is set away with eight fluid ounces of water, until all is dissolved; two fluid drachms of nitric acid is mixed with eight to twelve fluid ounces of water, and added to the solution. This is then evaporated with a moderate heat until the fumes of nitric acid cease to be evolved. This will be effected when the weight of the residue has reached about 12 troy ounces, and measure about six fluid ounces. The syrupy liquid is then brought to the measure of eight fluid ounces by the addition of water, and one fluid ounce therefore represents one troy ounce of the glacial acid. This forms a perfectly clear and transparent syrup, nearly free from any sediment whatever, but invariably has a faint amethystine hue which always appears on the surface of the dense residue after cooling. It is probably due to a trace of manganese which the nitric acid has oxidized into the permanganic state.

The diluted phosphoric acid, when prepared by the use of nitric acid, never fails to deposit voluminous vegetine like flakes of organic matter, which may be due to the action of the phosphoric acid on organic matter contained in the water, or a decomposition product of the nitric acid—at all events this does not appear when chlorhydric acid was substituted for nitric.

The writer here finds occasion to record a remarkable reaction with chlorhydric acid. Having repeatedly witnessed the above described deposit through the use of nitric acid, the writer resorted to the application of chlorhydric acid. This obviated the mould-like sediment, but produced a gelatinous slight flaky deposit in the strong acid, a result probably caused by a trace of silicic oxide. But when the phosphoric acid thus treated was concentrated in the usual manner, a dense syrupy liquid remained, from which the chlorhydric acid was yet very perceptibly evolved to the last, and it became evident that it could not be so perfectly expelled as the nitric acid; however, when the cooled syrup was stirred with a glass rod, the whole almost immediately congealed to a hard crystalline mass, with the production of considerable heat. If the liquid was not reduced quite so low, and then set away, in the course of a day or two it also solidified in better defined, large crystalline masses. These crystals were quite readily soluble in water, so that a solution could be made corresponding to half a troy ounce of the glacial acid in the fluid ounce. The writer at the time attributed this phenomenon to the presence of sodium phosphate, with which the commercial glacial acid was said to be largely adulterated. Yet, after the writer had observed this result three times in succession with different samples of glacial acid, the last being Merck's, it was concluded that perhaps the chlorhydric acid did not change the hydric metaphosphate. The crystalline residue from eight troy ounces of it was therefore dissolved in water, treated with two fluid drachms of nitric acid, and again evaporated. The syrupy residue weighed about 12 troy ounces, had the inevitable reddish tint, but showed not the least tendency to crystallize. Two drops of strong chlorhydric acid was then mixed with one fluid drachm of this liquid, which thereupon at once resolved itself into a crystalline magma, which became nearly solid by two additional drops more. The crystalline mass was mixed with the rest of the liquid and diluted slightly with water; the red hue was immediately extinguished, but no crystallization took place. However, when again evaporated to 11 troy ounces it again congealed from the contact with chlorhydric acid. The proportion of chlorhydric acid being so inappreciably minute could not have determined this crystallization by forming a chemical union, even in view of the fact that the concentrated boiling syrup yielded it up but difficultly. The writer explains it upon the basis of contagious action, the chlorhydric acid combining with water to form a less volatile and soluble hydrate induces the trihydric phosphate also to assume the solid form.

ALBUMIN.

BY R. ROTHER.

In a former article on starch and albumin the writer detailed an experiment by which he attempted to explain the non-appearance of coagulated albumin by boiling a percolate obtained from licorice root, of which a portion had been heated a short time to about 100° F. after moistening.

This pharmaceutically valuable effect upon some of the constituents of the root, whereby coagulation was totally prevented, rendered a once difficult and tedious process extremely simple and expeditious.

The writer then believed it to be due to the action of the starch upon the albumin, both of which bodies being present in the root.

In the endeavor to confirm this opinion the writer boiled starch and albumin together in a dilute solution, and found that the liquid after filtration was abundantly charged with albumin. However, having found that authorities state that egg albumin is only partly precipitated when boiled with water, and that the remainder is held in solution by the alkali which it contains, the writer repeated the experiment in the absence of starch, and found that when the liquid is kept well stirred during the heating, only an opalesence occurs, the liquid filters readily and gives the usual abundant evidence of albumin when treated with acids. Therefore the writer concludes that the nature of the peculiar change in the licorice root yet remains unexplained, unless it be due to the action of a peculiar ferment, which is insoluble until heated to a certain temperature in contact with the albumin of the root, and which then passes into solution together with the new products formed by its action.

SOLUTION OF ACETATE OF AMMONIUM.

BY R. W. FREDERICKS.

I just notice that the New Pharmacopœia has adopted as an alternate process, a modification of Dr. Pile's method for this solution. Yet I believe that it does not at all accord with the spirit of Dr. Pile's suggestion. If the acetic acid, as also the carbonate of ammonium of commerce, were always strictly of the officinal strength and composition, I doubt whether Dr. Pile would have found it necessary to file his objection and propose his excellent method. Dr. Pile's formula, or rather manipulation, was mainly based upon the fact of the inconstant strength of the acetic acid. He employed as the base of the standard of strength the carbonate of ammonium and graded the proportion of acetic acid of whatever strength he found it, according to its neutralizing capacity upon the carbonate. Having thus first established its definite relation to the carbonate in hand, the acid was diluted to conform in volume to the solution of the carbonate. Had the Pharmacopœia not so positively pronounced upon one, and one grade only, of acetic acid, a very unpractical provision, but established a strength ranging between certain limits, then the adoption of Dr. Pile's method would have been a very wise improvement. In that case, however, no further modification would have been admissible, as it was originally, both in letter and spirit, unexceptionable. The Pharmacopœia process as it now stands is simply a ridiculous failure.

The great difficulty is to obtain commercial acetic acid of a uniform strength. The specific gravity being ambiguous for certain strengths, cannot be relied on, and therefore, where a special degree of accuracy is required in the use of the acid, it must always be assayed. This is the object of Dr. Pile's process, and for all practical use it is sufficiently accurate. Yet, critically examined, even this serviceable process has its faults, namely, that the point of neutrality in case of acetates of the alkalies cannot be determined with test paper. Because these, though neutral, or even slightly acidified acetates, yet show an alkaline reaction on litmus.

An accurate assay can only be performed by treating the acid with an excess of a carbonate of an alkaline earth, as lime or barium, weighing the residuary excess of carbonate and calculating the quantity of acid from the difference between this and the whole amount of carbonate added. Such an assay would fix the strength of the acid, but would still leave the carbonate of ammonium in doubt. Thus it will be seen that the method proposed by Dr. Pile is after all the best under the circumstances.

All these difficulties in regard to the manner of making this solution, which on simple view seems easy enough, originate from the supposition that the carbonic acid held in solution is an important ingredient, and the idea is therefore to always have the solution fresh. It is a well-known fact that the solution is very unstable, and can be preserved only a few days before decomposition of the acetate occurs, indicated by the production of mould or similar organic growths.

I have found that ordinarily this solution can be easily made by diluting the acid to the required volume, then adding the carbonate of ammonium in several large fragments and pouring off the solution when effervescence has ceased. This is a good extemporaneous method, but is not convenient for preparing the small quantities that are prescribed in mixtures.

Nevertheless, I think that altogether too much importance is placed upon the carbonic acid supposed to be present. This is a delusive idea to entertain, for the carbonic acid is, on most occasions, wholly expelled when this solution is added to alcoholic mixtures; and such mixtures most usually occur in prescriptions to which acetate of ammonium is an adjunct. Take, for instance, the fever mixtures of spirit of nitre and acetate of ammonium. In such cases it makes no difference whether carbonic acid was at first present or not. After mixing there will be none, or at most only a trace remaining, and therefore if a physician builds much upon such a mixture, because of its supposed carbonic acid, he will most assuredly fail if his hope depends entirely upon this agent.

But the presence of carbonic acid is mainly assumed to aid the stomach in tolerating the acetate, and wherever this is the intent, and it can be carried out, the two solutions of Dr. Pile are especially indicated.

By mixing the solutions at once a violent effervescence takes place, so that comparatively large vessels are required to hold it at the moment of mixing. The mixture can never be successfully accomplished by pouring one after the other into the bottle intended to hold the solution, because of this effervescence, whereby most of it would be lost;* nevertheless the mixture can be accomplished readily without danger of overflow, by using two graduates, one just capacious enough to hold the whole liquid, and the other either of the same size, or only half as large. The acid is placed in the large one, and the alkaline solution slowly poured into it from the other measure. When the two solutions are united the mixture is several times—slowly at first—poured from one measure into the other, and then bottled. The solution now, however, is not quite yet in a portable condition, because it yet retains more carbonic acid than the water can permanently dissolve; therefore the bottle is corked and shaken, holding the cork down in the meanwhile to prevent its ejection. A moment after the gas bubbles will have ceased to rise and the cork can be loosened enough to allow the free gas to escape. This removal of pressure will occasion another rise of bubbles, but the liquid itself will retain its natural level. This shaking is repeated several times in the same way, and the bottle can then be permanently corked. I believe, however, that neither the finished officinal solution, or the two solutions of Dr. Pile, are in any way necessary. The officinal solution is too dilute for permanence, consequently I am of the opinion that it should be made stronger, even much stronger. I have long employed such a solution and find that besides its absolute permanence does not possess the unpleasant property of effervescing when mixed with alcoholic liquids. This solution is as definite as that of Dr. Pile, is always ready, never spoils, and can be used for preparing the officinal solution by simply mixing it with seven times its volume of water, it being eight times the officinal strength. The following is the formula for this:

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* This can be obviated by holding the bottle in which the solutions are to be mixed in somewhat of a slanting position, thereby allowing the generated carbonic acid gas an easy exit.—ED. PHARMACIST.

CONCENTRATED SOLUTION OF ACETATE OF AMMONIUM.

Take of Carbonate of Ammonium (Translucent), 8 troy ounces.
Acetic Acid, a sufficient quantity.

To 12 fluid ounces of acetic acid gradually add the carbonate in large fragments. After effervescence has ceased, and there is yet additional carbonate in the liquid, or if this be yet alkaline to test paper, then add acetic acid until a faint acid reaction appears. (The most correct indication of acidity is afforded by effervescence caused by dropping a small fragment of carbonate of ammonium into the liquid.) Then evaporate the solution to 12 fluid ounces, with a gentle heat.

CHLORINATED WATER.

BY M. R. MONROE.

Many novel, ingenious and important improvements have been made in the industrial production of chlorine gas. With all that the bulk of chlorine consumed in the arts is still obtained by processes based upon the oxidizing power of binoxide of manganese. The same manner of operating is also yet in use for the preparation of medicinal chlorine. But the solution of chlorine for medicinal use is an unstable article, and since chlorine water is not near so popular now as formerly, the difficulty of always finding a reliable chlorine water becomes great. Since the value of chlorate of potassa and its products of decomposition with hydrochloric acid has been firmly established, it may be safely asserted that the best days of the old-fashioned chlorine water are over.

This fact is surely not to be regretted, as this new departure abolishes one of the most odious labors of the pharmacist.

Chlorate of potassa is the great source of medicinal chlorinated compounds. Yet we must not lose sight of the circumstance that this same chlorate of potassa was in its turn generated by the action of chlorine produced precisely in the same identical manner as when used for technical applications. Therefore we still depend upon the old reliable and deeply rooted original method of Scheele for our chlorine supply. Chlorate of potassa is merely an elegant reservoir in which the refinement of advanced pharmacy stores its chlorine in an eligible and always available condition.

But we must not here commit the error, and take at once for granted that the chlorine actually present is the active agency we see in its results. Anything but this, when chlorine is made to act upon an oxygenated metallic base under peculiar circumstances, the whole amount of it is totally neutralized—that is, extinguished as to elementary individuality. Five-sixths of it at once combines as a simple chloride, whilst the remaining one-sixth assumes an apparently different form, but nevertheless forever after retains only the function of a simple chloride, surrounded by the oxygen of the water, made active through the deprivation of its hydrogen by means of the free chlorine. Thus:

$$3K_2O+Cl_6=5KCl+ClO_3K.$$

Or assuming, for the sake of simplicity, the action of chlorine upon water, in absence of metallic base, we have

$$3H_2O+Cl_6=5HCl+ClO_3H.$$

But this latter reaction is not probable, notwithstanding the decomposition of water in contact with free chlorine. For if we have chloric and hydrochloric acid brought in contact, as for example in the case with chlorate of potassa and hydrochloric acid; then

$$ClO_3K+6HCl=KCl+3OH_2+Cl_6.$$

there is a reproduction of chlorine. But the original chlorine remains latent. For as above, we notice that five-sixths of the chlorine combines with hydrogen or metal as simple chloride, whilst the oxygen accumulates in an active form about a single atom of chlorine, which, whatever its condition may be in that state, never results as anything more than simple chloride when disruption ensues. But the oxygen thus made available is capable of again liberating six molecules of chlorine in the presence of free hydrochloric acid, as shown in our last equation.

It is therefore not chlorine direct which we possess in chlorate of potassa, but the agençy which will liberate its equivalent of chlorine when brought in contact with appropriate material embodying it.

Hydrochloric acid, acting on chlorate of potassa, does not necessarily yield theoretically chlorine, but several intermediate oxygenated compounds are produced equal, and often superior in their medicinal effect to chlorine alone. That is why these so-called chlorine mixtures have attained such a deserved popularity. It only remains to have a uniform standard for this mixture, and the following formula attains this desideratum:

Take of Chlorate of Potassa, 10 grains.
Hydrochloric Acid, 1 fluid drachm.
Water, 1 pint.

Throw the chlorate into a dry pint bottle, and pour in the acid; then let stand a few minutes, agitating occasionally, and pour in four fluid ounces of the water and shake; then add four fluid ounces more of the water and shake again. Finally add the rest of the water, cork well, mix, and keep the mixture in a cool place.

The greenish yellow gas evolved from chlorate of potassa by the action of hydrochloric acid is thought to be a mixture of chlorous oxide (Cl_2O_3) and free chlorine, which is not ordinarily considered as explosive, owing to the stability of the chlorous oxide. But when these substances are mixed in considerable quantities, the gaseous product becomes violently explosive under moderately elevated temperature. It is therefore probable that a small quantity of the highly dangerous tetroxide of chlorine (Cl_2O_4) is also produced.

LABORATORY NOTE ON THE RED AND GREEN IODIDES OF MERCURY.

BY F. R. WILLIAMS.

Nearly 10 years ago I was frequently engaged in the manufacture of considerable quantities of red and green iodides of mercury. At first I was in the habit of washing the green iodide with alcohol to purify it from adhering red iodide, as is usually done. But on one occasion, by reason of a misunderstanding, the proportion of iodine was considerably increased, and therefore the union between it and the mercury was almost instantaneous and very violent, so much so that the whole material was for a moment in a complete state of fusion, the evolution of heat being sufficient to fill the spacious apartment with dense violet vapors. The proportion of the materials was then rectified by supplying the deficiency of mercury, and the mixture was now thoroughly triturated. The resulting compound did not have the deep olive green color that this preparation usually possessed; but on the contrary, it was of buff or yellowish green cast. Alcohol did not change its color, and therefore I presumed that the intermediate iodide had been largely formed, or that the mixture contained an extraordinary amount of the red iodide. The washing with alcohol was then continued, and the filtrate at intervals examined by dropping it into water, the production of a precipitate indicating the presence of red iodide. Formation of turbidity remaining undiminished, I was led to believe that alcohol could not purify this lot. Very little satisfaction was obtained by referring to authorities, and at last I concluded that as the Edinburgh process for preparing red iodide of mercury consisted in part by crystallizing it from a hot solution of chloride of sodium, this might also answer for purifying the green iodide, consequently I boiled the refractory mixture with a strong solution of chloride of sodium and succeeded admirably in removing the poisonous red compound. After this I never employed alcohol, but always washed the green iodide with a hot solution of chloride of sodium for purification. I found this to be the most economical, expeditious, convenient and thoroughly efficient operation that could possibly be devised.

In the manner of preparing the red iodide I resorted almost at the outset to a very important modification of the ordinary way. The unnecessarily great amount of water employed is a disagreeable feature when the process is applied in the production of large quantities. Knowing that red iodide of mercury is only sparingly soluble in a strong solution of hydrochloride of ammonia, I introduced this latter salt into the formula, so as to obtain a very concentrated solution of corrosive sublimate, and in this manner get rid of an enormous quantity of water. The strong solution of the chloride of mercury made with the aid of the ammonia salt is mixed with a similarly concentrated solution of iodide of potassium and the heavy precipitate of the red iodide subsides rapidly. Pints of water accomplish here what formerly gallons only could effect. My process is given below.

℞		
	Corrosive Chloride of Mercury,	4 parts.
	Iodide of potassium, - -	5 "
	Hydrochloride of Ammonia,	2 "
	Water, a sufficient quantity.	

If not already in powder, pulverize the ammonia salt coarsely. Then put the mercury chloride into a convenient wedgewood mortar and crush it (this can be easily and quickly done); add to it the hydrochloride of ammonia, and pour on three or four parts of water, triturating until the salts have dissolved. Now dissolve the iodide of potassium in five or six parts of water, and pour it into the first solution, collect the precipitate on a strong filter, wash it thoroughly with water and dry it in the open air.

NOTE ON AQUÆ MEDICATÆ.

BY F. W. REINHOLD, JR.

The notion that medicated waters should be made by distillation still has a strong hold in the views of many pharmacists. Recently a modification of the distillatory process has been advanced, and that is, to distil the volatile oils with water, instead of the herbs, barks, etc. If the volatile oil is pure there is certainly an advantage in this change. Defenders of the methods by distillation would lead us to believe that medicated waters, particularly those made from fresh herbs, are so very superior in the characteristic flavor, strength, and general permanence. But the best authorities on this question rather confirm the popular supposition that such distilled products, on the contrary, possess a very disagreeable herbaceous rankness, the peculiar leaf-odor and taste, which is anything but desirable. Waters of this kind must always have age, during which time the rankness disappears, leaving them a natural and pleasant fragrance. Medicated waters prepared from dried but not too old herbs, yield pleasanter products than the fresh. Many volatile oils, when freshly distilled, have the same peculiar rankness, which disappears after some time. But the same volatile oil may later again become rank, through oxidation, if not properly protected against atmospheric action. There is no use for agitators in favor of distillations to try so hard in widening the sphere of this process. Pharmacists generally are not so much in love with the retort business as to extend its utility to the medication of waters. Medicated waters are prescribed so largely and so indiscriminately, that many pharmacists would have to keep a special medicating laboratory of stills in constant action for their required supply. Besides, waters thus prepared would entail extra and unnecessary expense on the consumer, without a really intrinsic value in return. The plea that the distilled waters are far the strongest is vain. Water will only dissolve a certain amount of volatile oil to become saturated, and therefore no manipulation will impregnate or supercharge it with more. Water can be easily saturated with any particular volatile oil without taking refuge to the retort.

So-called concentrated waters are also used, especially in England. These waters are said to be stronger than the officinal. They are sold to retail pharmacists for the purpose of making the ordinary medicated waters. But such a traffic, in its very nature, is fraudulent in the last degree. When the officinal waters are already assumed to be saturated, how, in the name of reason, can simply water then dissolve sixteen times its saturating proportion of volatile oil? But the case is made plain when we know that diluted alcohol will just do this very thing. Most volatile oils will form a perfect or nearly perfect solution with diluted alcohol, or a mixture of equal parts of the strongest alcohol and water, in the proportion of four mimims, or eight drops, to the fluid ounce. This solution, when poured into about 15 fluid ounces of water, will form a clear solution in most cases. A pint of this kind of medicated water will then contain additionally half a fluid ounce of alcohol, equal to about three per cent.

The best way to make these concentrated waters is to dissolve the oil in half the alcohol and mix the remainder of the alcohol with twice its volume of water, and then pour into this the first solution, with constant stirring. After standing a few hours the solution is filtered, if desirable, through magnesia alba.

To make concentrated camphor water 16 grains of camphor are dissolved in 2 drachms of alcohol, and poured with rapid stirring into a mixture of two fluid drachms of strongest alcohol and half an ounce of water. This makes a clear solution. On pouring this into 15 fluid ounces of water it also makes a clear solution on shaking. The water then contains one grain of camphor to the fluid ounce, which makes it rather stronger in camphor than usual. The reason is that water containing even so little as three per cent. of alcohol is a better solvent than pure water. This also holds good in regard to volatile oils. Medicated waters containing a trace of alcohol are not so apt to become turbid, in contact with saline substances, which is a very annoying feature, particularly with camphor water, which throws out abundance of camphor and assumes an unpleasant appearance when certain salts are dissolved in it. For the prevention of this precipitation the presence of a little alcohol is especially good.

I believe, however, that the best way after all to make the medicated waters, is to prepare them by simple maceration. That is, to shake the volatile oil with the water, then set it aside for a day or two, and shake the mixture occasionally, and finally filter. I find that this saturates the water completely and avoids the presence of magnesia and alcohol. The results I deem superior to the distilled waters, if care is taken to use pure and good oils. I find that the solubility of oils of bitter almond and gaultheria is far greater than that of the other volatile oils proper. The act of solution is almost instantaneous in each case, so that no time is required to arrive at complete saturation of the water. The oil of bitter almond seems to be the most soluble of the two.

One minim of volatile oil of bitter almond will dissolve perfectly and instantly in six fluid drachms of water, without the addition of alcohol or magnesia alba. According to this the originator of the officinal aqua amygdalae amarae did not immortalize himself much when he concocted a formula which employed a quantity of magnesia alba for no purpose at all, and then used only six minims of oil to 12 fluid ounces of water, when the same quantity of water would have completely dissolved 16 minims of oil without the aid of magnesia alba.

In making camphor water the camphor is first pulverized and then shaken with the water, similar to the manner of making the other waters. The camphor can be powdered, with the addition of a few drops of alcohol, but even this alcohol is not required, because the addition of the same amount of water will accomplish the purpose equally well.

THE PEPSIN MUDDLE.

BY PHILIP L. MILLEMAN.

I wish to know with what degree of justice to himself and the profession Scheffer still maintains the unreasonable price of his pepsin, if, according to Rother's statement, the yield of it is so great. It strikes me that the veil of mystery yet lies heavily upon important facts relating to the pepsin question, and it is the province and interest of those who *know* that they should speedily be brought before us in the light of truth.

The results of Rother seem almost impossible, since the existence of such nearly unlimited quantities of that potent ferment constantly within the very substance of the stomach, would, judging from Scheffer's experments, be threateningly destructive to that organ. That the mucous secretion of the stomach is extremely powerful as a digestive, we are well aware, because many operators of late have conclusively shown that the dried mucus must have more than ten times the strength of Scheffer's saccharated pepsin, if the quantity of albumen dissolved by it is any criterion of comparison.

Then, since this is the case, I do not conceive wherein there is the utility of first exhausting this with water, and reprecipitating it when an almost inappreciable membranous portion only needs separation, and which in a pharmacal point of view is neither deleterious or in any other way objectionable.

I believe that a pulverulent form of pepsin is most desirable, but it should always possess a definite power, upon which we can implicitly rely. Now if Rother's preparation proves to be of the required strength, which only remains to be seen, there can be no objection against the large yield, even if the product is not quite free from other contaminations, so long as it represents the required power.

About five or six years ago, when glycerin began to be used so much in pharmacy, I also experimented with it very considerably. I employed it in numerous cases, with the object for which it was then so loudly praised, of preventing spontaneous precipitation and decomposition in the organic galenical compounds; as for instance, in the cinchona preparations, tincture of sanguinaria, and I also applied it with supposed advantage in the preservation of hydrated sesquioxide of iron, upon which subject I had the honor of reading a paper at the meeting of the American Pharmaceutical Association, in 1867, held at New York.

In the winter of 1868 I was engaged in the preparation of considerable quantities of liquid Rennet, then much prescribed by several prominent physicians of this city, and being in the midst of my glycerin trials, I also used this in the extraction of the stomachs, simply replacing the sherry wine prescribed in the formula by an equal amount of glycerin. During cold weather, I found this preparation to keep perfectly, but being particular to know what effect the summer temperature would have upon it, I was giving this the full measure of the test, when the article of Mr. Long, in the Dublin *Medical Press and Circular*, appeared, giving the full outline of the use of glycerin for this purpose. This valuable paper, which gave the first public intimation of the employment of glycerin in the preparation of digestive fluids, was republished in the December number of the *Pharmacist* of 1869. I did not claim the priority of the method, however, but I was not a little surprised to see in the March number, of 1870, of the *American Journal of Pharmacy*, almost the precise process of Mr. Long published in a long-winded manner, and purporting to be an original discovery by E. Scheffer, of Louisville, Ky., who indicated by his liberal use of the first person singular, and the particular stress he placed upon it, that he could not possibly be aware of Mr. Long's previous discovery, and has since considered himself sole proprietor and manager of the pepsin concern.

The fact of this piracy was much commented upon, and I became perfectly disgusted with the editorial section of the *Pharmacist* for not vindicating Mr. Long, to whom, in my opinion, gross injustice had been done.*

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* The writer of the above is on the war-path, and seems "spoiling for the fray." On general principle he finds fault with everybody, and consequently the editorial department of THE PHARMACIST receives its share of censure at his hands. We are not disposed to find too much fault with the criticisms of contributors to our pages; yet, when the gauntlet is thrown down, as in this case, it becomes necessary that we

Subsequently the stirring news arrived, *via.* the *American Journal of Pharmacy*, February number of 1872, that the once obscure Scheffer had suddenly risen to most towering greatness by his wonderful discovery of precipitating pure pepsin with a saturated solution of common salt. That this should have been really true, impressed me deeply. For who with any kind of experience with the usual process for making liquid rennet, has not observed the peculiarly slimy precipitated matter which the addition of a moderate amount of salt invariably caused in the acidulated extract of the stomachs. This precipitate I had noticed frequently, but never attributed peptic properties to it; for Liebig, Meissner, and others, had shown, many decades since, that concentrated solutions of various salts precipitated the parapepton resulting from the digestion of albuminous matters. On the strength of such eminent authority, I always viewed this precipitate as parapepton, even in opposition to the observation of Bruecke who found that many bodies, when finely suspended, as would occur at the moment of their precipitation, always carried the pepsin with them out of solution; and in fact Bruecke's method of preparing absolutely pure pepsin is based upon this circumstance, which is further supported by the exceedingly important fact, ascertained by Von Wittich, that coagulated albumen is capable of absorbing the pepsin completely from its solution.

If Scheffer still insists, in view of these acknowledged facts, that he has made a great discovery, he is certainly very much mistaken. Mr. Rother, no doubt, thought he was doing Mr. Scheffer a vast service by such inordinate puffs as "famous process," etc., but I fear he has unintentionally interfered with the "commercial interest" of Mr. Scheffer, by letting us know how terribly Scheffer has been fleecing the profession by selling them "*pepsin?*" at $1.50 per ounce, which is no better, if as good, as the dried mucus scraped from the membraneous walls of the stomach. If Scheffer is dealing honorably with us he will please step forward like a man and justify himself or Rother.

STUDIES OF THE MATERIA MEDICA OF THE CHINESE.

EXTRACT FROM A REPORT ON THE INVESTIGATION OF M. M. LEON SOUBEIRAN AND DABRY DE THIERSANT, MADE TO L'ACADAMIE DE MEDECINE: BY M. A. GUBLER.

TRANSLATED BY CHARLES C. FREDIGKE.

In their exposition, our fellow-countrymen have adopted the natural classification. The products of the materia medica are divided into minerals, animals, and vegetables, and the two latter groups are sub-

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take it up, and ask that whenever our worthy contributor has fully recovered from the excitement of the rampage, to consult the 8th volume, page 319, of the Proceedings of the American Pharmaceutical Association, where he will find recorded that a Mr. A. Cushman presented a paper on Pepsin at this meeting (1859), in which he suggests the use of glycerine. This was 10 years prior to either Mr. Long's or Mr. Milleman's investigations. We would say that no harm will result if future writers will only take the trouble to consult ALL the literature on this "muddle."—[ED. PHARMACIST.]

divided into families. Each substance is designated by its vulgar name in Chinese and by its corresponding scientific denominations. Then follow accounts concerning their properties, their use, and their mode of application. It is evident that in order to ascertain their identity and fix their synonyms our authors had to apply themselves to a minute study in comparing the different products, and to bibliographical researches, always difficult, and rendered more laborious yet by the obscurity of texts.

What strikes one at first view, on looking over, at a glance, this vast description, is that it reproduces in its ensemble, and even in a great number of its details, the features which we are accustomed to meet with in the materiæ medicæ of Europe. Here we see figure, with astonishment, the greater part of the substances used among ourselves, and it is, moreover, not without some surprise to find a similarity in the indications, and, to a certain point, the theoretical ideas which direct their employment. In looking over the work of M. M. Leon Soubeiran and Dabry de Thiersant we think to see the materia medica of Geoffroy or some one of those old treatises in which an infant science, little assured in itself, does not disdain to receive, notwithstanding its observations or its prejudices, the errors of the charlatans of the period and of popular superstitions.

We will surprise nobody then when we say that the idea of specifics, correlative with that of ontology, seems to have governed the medical practice in China, as it has done lately in Europe. One substance is endowed with a virtue essentially anti-rheumatic or anti-spasmodic; another with a power inexplicable, irreducible to other properties more simple, to cure directly, *proprio motu*, phthisis, syphilis, or rabies.

Besides, the Chinese are persuaded, as we have been during the middle ages, that Providence, little trusting to our instinctive faculties, wished to address itself to our intelligence by teaching us to distinguish injurious things from those which are useful. According to this conception Nature would have taken care to stigmatize the poisons and adorn the remedies with marks, calling immediately to man's mind the services which he has a right to expect from them. This is what is called the *doctrine of signs.* The belief in this singular dogma reveals itself at each step, so to say, throughout the Chinese materia medica.

It is thus that the fire-fly is recommended against the affections of the visual organs; that a species of madder (*Rubia Munjista*), the root of which is red, is thought to promote the menstrual flow; that *Polygonum tinctorium*, which furnishes indigo, is reputed as efficacious against the petechial fever; that the reniform fruit of *kadsura chinensis* has aphrodisial properties, and that *ginseng*, the bifurcated root of which resembles a man's thigh, possesses the power of restituting to invalids and old persons absent vigor and virility. Considerations of the same kind have doubtless caused the reputation of *Cordiceps sincensis* as an excitant of the genital organs; that of *Bidens parviflora* as an infallible means to make the finger-nails grow; or that of *Vitex incisa* to increase the growth of the beard; finally that of *apocynum juventus* as a remedy to preserve youth. And if the horns of the deer are exposed in China in such elegant works, enjoying so much favor with the crowd of the surfeited uppertendom, is not their distinction due to the courage and the generous ardor of which that fine animal gives proof at the time of heat.

These are strange illusions, certainly; but they deserve indulgence, especially on the part of people whose ancestors entertained them. When we believed in lung-wort to cure phthisis, in gromwell (lithospermum officinale) to drive away gravel, and in the carrot to dissipate jaundice, then modesty becomes an indispensable virtue.

In addition to this the Chinese show themselves, in other points, of genuine practical sense, and even scientific tendencies, on account of which they ought to be praised, and which should pardon certain of their errors. For instance, we see in their materia medica astringent substances, either vegetable (oak gall-nuts, Chinese galls, etc.), or mineral (alum, acetate and sulphate of iron, salts of lead, silver, etc.), used as bitters to fortify, confine, (to restrain, as, for instance, the bowels), drive away the fever (*Salix babylonica*, *Populus tremula*, *Dichroa febrifuga*), arrest profuse perspiration, stop atonic diarrhœa, spermatorrhœa. Also the aromatics, the essential oils, simple or sulphuretted, the balsamics used as diffusive stimulants, febrifuges, anti-spasmodics, and to check catarrhs. Such are the remedies furnished by the Labiatae, the Umbeliferae and the aromatic Compositae, the Myristicaceae and Styracaceae, garlic, santal, *Daphnidium cubeba*, and many others. Wormwood and saffron are considered as emmenagogues, and the abortive power of the ergots of rice and of wheat is perfectly understood.

Chinese medicine employs since time immemorial mercurial preparations against syphilis; arsenic in strumous affections, herpetic, and certain intermittent fevers; iron as a blood renovater. Borax is prescribed against thrush, nitrate of soda as a diuretic; carbonate of lime as an absorbant, and lime liniment in burns.

Ancient authors recommend the ashes of sea-wrack (Fucus vesiculosus) against goitre. The Chinese use, as we do, sulphur, acetate of copper, castor oil, gamboge, aloes and rhubarb, aconite *Veratrum* and *Calchicum;* camphor, musk, opium, and the Solanaceae. They have sternutatories, sialagogues, and anthelmintics analogous to ours; more, they believe to possess as large a number of substances capable to prevent or dissipate drunkenness. (*Betonica officinalis*, *Honenia duicis*, *Chrysanthemum album*, nutmegs, borax), or better, to exert an influence over the lacteal secretion, either to suspend (malted barley) or to increase it (*Silene? Alisma plantago*).

Let us add, and this is not the least remarkable particularity, that surgical anæsthesis, general or local, has been very anciently used in China. The great surgeon Houa-To—who brought into vogue hydrotherapeutics—used already a species of *atropa*, described by the Pen Tsao, and which produced an insensibiltty sufficient to permit grave operations on the abdomen. *Datura alba* acts in the same way. Besides *azalea procumbens*, which is often ranked with henbane for its narcotic quality, when mixed with powdered aconite root, can produce a local anæsthesis, which may be of use in small operations.

It would be fastidious to prolong still more this parallel; for the examples cited amply suffice to show the general similarity of the Chinese materia medica with those of Europe. Is it yet needed to dwell upon the necessary differences? We don't think so; but would believe to have accomplished only a part of our labor, at any rate, would have realized but half our design, if we would not impart to our colleagues our observations on some new facts, which attracted our attention, and on medical doctrines the relative explanations of which, as to each substance, visibly bear the imprint.

(*To be continued.*)

ON THE ACTION OF HEAT UPON SOLUTIONS OF HYDRATED SALTS.

BY CHARLES R. C. TICHBORNE, F. C. S., M. R. I. A., HONORARY MEMBER OF THE CHICAGO COLLEGE OF PHARMACY.

Read before the Royal Irish Academy. Received from tho Author for Publication.

When considering the dissociative action of heat upon water of hydration, some evidence was naturally sought amongst those salts which present a change of color when passing from the dry to the hydrated state. The salts experimented with were those of cobalt, copper and nickel.

As regards such bodies, it is a general characteristic that neutral solutions of any of their chlorides do not change color on boiling at ordinary atmospheric pressure; nor does the amount of dilution affect the tint any further than what would be due to attenuation. But in no case, where a color change is evinced between the dry and hydrated salt, have I failed in obtaining a dehydration of it in solution by using extraordinary pressure. The laws of such a chromatic change differ from those produced by a basic condition of the salt, as will be seen further on.

Let us take, for instance, the dehydration of the salts of cobalt, which is evinced by a well-known change of color—the conversion of the light rose color into a dark and pure blue. The following observations conclusively prove that water of crystallization, or hydration, are easily held asunder in aqueous solutions by the dissociative influence of heat. That is to say, in a similar manner to the phenomena noticed as regards the basic and ultimate molecules in the troxide group.*

No amount of boiling will, however, convert a pink solution of cobalt into a blue one, unless extremely concentrated. But it was observed by Prout, many years ago, that on evaporating a *strongly acid* solution of a cobalt salt to a concentrated point, he got a permanently blue solution, which, he considered, was due to the abstraction of the water of hydration by the acid. Prout also stated that he had obtained from such a solution blue crystals, supposed to be the anhydrous salt: this requires verification.

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* Tichborne on Molecular Dissociation.

Conceiving that the cobalt salts would, from their chromatic display, be well suited to illustrate the dissociation of water of hydration by heat, I was rewarded by finding that it answered admirably for this purpose, and gave results which may be used as beautiful lecture experiments.

The thermanalytic point of the cobalt salts being above 100° C., no results, as before stated, will be obtained on boiling a neutral solution; but if any substance capable of exerting an affinity for the water of hydration be introduced, the thermanalytic point of the salt will be lowered, as shown by Prout's experiment. Sulphuric and other acids, chloride of calcium and other hygrosopic salts, and even sugar, act in a similar manner.

However, as the quantity of these dehydrants required to affect the cobalt solution was considerable, I used alcohol to lower the thermanalytic point. Chloride of cobalt, dried at 100° C., and dissolved in pure and absolute alcohol, gives a magnificent pure blue, free from the slightest tinge of purple. For this purpose it is necessary that the alcohol should contain no water, and it is desirable to rectify from anhydrous sulphate of copper, or chloride of calcium. The following instructive illustrations may be shown with chloride of cobalt:

1. A blue alcoholic solution, obtained in the above manner, is placed in a deep beaker, and water is cautiously poured down the side of the vessel. Two layers will be produced, of two different colors, and will remain in this condition for some considerable time, by virtue of their different gravities. The upper layer will be blue, and contain the anhydrous salt; the lower will be pink, and contain the hydrated salt, rendered so by the direct addition of water.

2. A beaker of the alcoholic solution which has been hydrated by the addition of water is peculiarly sensitive to heat. If it is gradually heated upon a water bath, it passes, as the temperature rises, through all the shades of pink and purple, until a pure blue is produced, giving the same absorption spectrum as that obtained from the anhydrous salt. The thermanalytic point is so lowered by the alcohol present that the water of hydration of the cobalt salt is gradually but perfectly dissociated.

If we now submerge this beaker half-way into a freezing mixture, we, in a short time, obtain similar chromatic and chemical results as in the first instance; but in this case the phenomena are brought about by different means. In the beaker we have two layers, exhibiting the upper or blue one, containing the anhydrous salt, the water being present, although dissociated.

3. It was easy to portend that, although impossible, at ordinary atmospheric pressure, and in an ordinary aqueous solution, to dissociate the water, it is only necessary to boil such a solution under a sufficient amount of pressure to obtain the thermanalytic point.

This was demonstrated by the following experiments: A weak solution of cobalt was sealed up in a glass tube, two-thirds of the capacity of which was empty. On boiling the liquid in this tube, the solution gradually passed through all the shades of purple, until the contents ultimately became of a pure blue. Thus in this aqueous solution we had obtained, by extraordinary pressure, the temperature necessary for the separation of the water.

Chloride of copper gives a beautiful blue solution in water, which is characteristic of its hydrate. It gives a brownish yellow salt in the anhydrous state; its solution in alcohol gives a greenish yellow; or, in pure ether, which has been acidulated, a brownish yellow appearance. The beautiful blue solution of the neutral salt, when heated in a sealed tube to a high temperature, becomes gradually green, yellow, and ultimately a dark brown, and nearly opaque liquid. As it cools, it gradually associates the water of hydration, and passes again through all these shades; but when cool it becomes a little opalescent, from the formation of a bluish white and basic precipitate. Therefore, for illustrating this experiment, it is better to use a slightly acid solution, which, from the presence of the acid, is even more sensitive to heat, and regains its original condition on cooling; hence this experiment can be performed with the same tube *ad infinitum.*

A solution of sulphate of copper, heated in sealed tubes, gives somewhat similar results as regards dehydration; but a basic salt is determined even in an acidulated solution.

The nickel salts do not, as a rule, so strikingly illustrate this phenomenon of chromatic change, although as it is well known, the hydrated salts are green, and the anhydrous salts more or less yellow. Heated under pressure, the green chloride, when in solution, seems to be intensified in the first instance, then becomes yellow, and ultimately a dark yellowish green. This, at first sight, would appear somewhat anomalous, but, on examination, its anhydrous alcoholic solution presents similar anomalies on catiously adding a weaker alcohol.

It is necessary, in these experiments, that considerable caution should be used, as an explosion frequently occurs. As wire gauze would prevent the gradual change in color from being observed, it is better to heat the experimental tube in a second glass, one considerably larger. The experimental, or hermetically sealed one, should be as small in calibre as the necessary observations will allow of. The volume of liquid necessary for proper observation will, of course, depend upon the depth of color of the solution, and the amount of solution should have a small proportion to the capacity of the tube. Tubes for this purpose were made by taking a white glass tube of some considerable strength, and drawing it out until it has a diameter of $\frac{2}{100}$ to $\frac{4}{100}$ths of an inch. My attention was first drawn to the value of capillary tubes for experiments similar to the above from a lecture delivered by Dr. Andrews, "on the continuity of the liquid and gaseous state of matter."

A most important observation made in connection with this investigation is the difference observed between the effects of dilution on color-changes attending the basic condition, and on color-changes attending dehydration. As might have been predicted on theoretical grounds, it is exactly the reverse in the latter case to what it is in the former. In a report recently read before the Academy, I pointed out that color-changes, resulting from formation of basic salts by dissociation (i. e. chromic or ferric salts), are influenced by the fact that dilution lowers the thermanalytic point. This is due to the basic action of the water itself. But it is self-evident that an increased volume of water will act differently in cases where the change of color depends upon dehydration. In the first case the increase of volume in the water will assist the dissociation, and lower the thermanalytic point. In the second case, the increase in the relative volume of water retards the dissociation of water of hydration. In the second case it is inversely to the amount of dilution. Thus a solution formed of equal weights of crystals of ferric chloride and water, is not greatly affected by heating to 100° C., while no solution of chloride of cobalt weaker than five per cent. is affected at the boiling point of water. The thermanalytic point may be determined approximately by taking a capillary tube containing the salt to be tried, and putting this into a second tube containing a mixture of chloride of calcium and glycerin, which will carry the temperature up to 200° C., or a pressure of about 16 atmospheres. Heat is now carefully applied, at the same time that the temperature is determined by a thermometer, which can be used to keep the whole moving. In the following Table a series of observations made with chloride of cobalt is placed in juxtaposition with one made with ferric chloride, to illustrate what has been just said:—

Dissociation, attended with the formation of a Basic Precipitate Fe_2Cl_6.		*Dissociation of Water of Hydration $CoCl_2$.*	
Percentage of Crystals.	Temperature to determine. Precipitation.	Percentage of Crystals.	Temperature and Color.
50	Over 100° C. No Precip.	50	60° Amethyst. 77° Purple. 100° Blue.
10	94°C.	25	85° Amethyst. 124° Purple. 135° Blue.
5	82°C.	10	180° Amethyst. 195° Purple. 227° Blue.

The dissociation, therefore, of the water of hydration of salts when in solution is gradual, and progresses with the increment of temperature until perfect dehydration takes place. It is evident, also, that in the salts tried perfect dissociation takes place at a higher point than the boiling point of water, when operating at ordinary pressure, and except we are dealing with very concentrated solutions. It then becomes difficult to determine how far dissociation of the more ultimate molecules may play an exceptional part in the decomposition. Lastly, we also perceive that dilution raises the thermanalytic point as regards the molecules of hydration.

OINTMENT OF MERCURIC NITRATE.

BY R. ROTHER.

The writer is occasionally favored with correspondence of the following import:

MR. R. ROTHER.—Dear Sir: In ointment of Mercuric Nitrate, made by the formula proposed by you in the PHARMACIST, have you ever noticed that the mercury has become reduced and made its appearance in globules? We have recently had that experience with some of the ointment so prepared.

An answer would much oblige, yours very truly, T. D.

This is a most melancholy fate allotted to the pet process of the writer. While preserving an enduring constancy in the results at his hands, it has met with the saddest experience in the self-sufficient clutches that never brook the despotic, circumscribing shackles invented by the dogmatic whims of formulators.

The first stunning effect in the writer's knowledge was tallied against it, although gently, by the kind commiseration of a very eminent man, who has since distinguished himself in literature and various other noteworthy and conspicuous ways.

In deep and ominous silence he lifted with disenchanting, sombre movement, the cover from an ointment jar, and displayed to the expectant gaze of the writer a mass of beautifully yellow-colored ointment, which had all the outward appearance of the product invariably obtained by the writer himself with the process in question. On closer view, the ointment showed stained impressions, apparently caused by the double back-action of a steel spatula. "There," he burst forth in a moderate stentorian effort, "that scoundrel of a boy has already been at it." But immediately he seized upon a broken steel spatula, and assaulted the yellow mass in a furious manner, without, however, being able to make any very serious indentation upon the resisting surface. What effect this had on the spatula the writer is unable to state with any degree of certainty, as that was already badly lacerated, perhaps from a previous series of similar attacks. "There," he less vehemently resumed, "is your celebrated citrine ointment." But on further inquiry, the writer ascertained that the fatty menstruum was some of Fairbank's fire-proof, infusible lard, which is probably put up for consumption in the torrid zone, or some hotter climate.

The next indication of this chronic inefficiency of the process, the writer received through the learned disquisition of Chas. C. Fredigke, who volunteered a correction, which, in his manner of thinking, allayed the difficulty perfectly. But the writer is not clear to this day what all that say had to mean, and in what æsthetic points that improvement consisted.

The third man heard from was a genius down in Cleveland, Ohio, whose name the writer's memory has irretrievably neglected. His remarks, and the notion he seemed to have of the process, were about as clear as the ointment he produced, which, to judge from his incoherent tragedy of the king's English, must have been, in the classic language of the day, as clear as mud. A noticeable feature of the complaint was the destruction of a very large quantity of valuable material. The writer feared that damages might be inferred from this, and therefore lost no time in ascertaining whether the offense of misleading the unsuspecting lad into the loss of his goods was actionable on the charge against obtaining property under false pretenses.

For the present, the writer's only suggestion on his most fallacious process is, that these experimenters first study their primers thoroughly, so that hereafter they will be able to read English when they see it.

DETERMINATION OF MANGANESE IN SOIL AND ASH.

BY A. LECLERC.—TRANSLATED BY E. HALLOCK, A. M.

The author determines the manganese analytically by converting it into permanganic acid, and titrating with a suitable solution. The change may be easily brought about with red lead, because the only bodies which are able to act upon the permanganic acid are iron and aluminum, and they are present as oxides. The soil to be tested is first ignited and then boiled with pure nitric acid, care being taken to prevent its getting dry, for nitrate of manganese is decomposed at 140° C. into binoxide of manganese, which is scarcely attacked by nitric acid. When the action is ended the liquid is filtered and diluted to a certain volume. A portion of the solution, in which the chlorine has been determined by means of nitrate of silver, is brought to the boil in a porcelain dish, and then instantly removed from the fire. As soon as ebullition ceases, a little mennige or red lead is added and well stirred; the liquid becomes violet colored, is left a few minutes to settle, then filtered through asbestos which is free from chlorine, and a volumetric determination made. The solution contains a slight excess of nitric acid, together with permanganate of potash, nitrate of lead and salts of iron, aluminum, magnesium, calcium, sodium and potassium. On account of the presence of nitrate of lead, the double sulphate of iron and ammonia cannot be employed for this purpose, as the precipitated sulphate of lead would mask the change of color which marks the termination of the experiment. Neither can oxalic acid be employed, for unless a large excess of nitric acid is present, carbonate of lead would be formed. The author therefore tried the subnitrate of mercury, and obtained very satisfactory results. In the presence of such an energetic oxidizing agent as the permanganate of potash, the suboxide is readily converted into the oxide salt, and the end of the reaction is indicated by the reddish color of the solution changing to a green if much manganese is present, or in the liquid becoming cololress if but little manganese is present. If the solution is sufficiently acid no precipitate is produced by the mercury salt; if, on the contrary, the solution is neutral or nearly so, the oxide of manganese is precipitated. The solution of subnitrate of mercury is prepared with volumetric chamelion solution. The method is equally well adapted to the analysis of ashes, and has been tested by the author by numerous experiments, all of which gave satisfactory results.—*Journal of Applied Chemistry.*

Destroying Ammonic Chloride.—Prof. J. Lawrence Smith recommends the use of nitric acid for destroying any excess of ammonic chloride that may be present in an analysis. The solution is evaporated to a small bulk, and then an excess of nitric acid added and the liquid gently evaporated to dryness. The chloride of ammonia passes off as protoxide of nitrogen and chlorine. This method was first published by the professor about twenty years ago, in his celebrated paper upon alkaline silicates, but it seems to have been generally overlooked by chemists. We have used it with success in the course of our analytical work.—*Ibid.*

CANCER ANTIDOTE FRAUD.

Dr. Garrison, in the April number of the *Chicago Medical Times*, exposes one of the numerous cancer remedy frauds, which is under the management of a worthy so-called Professor Buchanan, of the noted *bogus diploma* school of medicine, of Philadelphia, and a self-styled analytical chemist by the name of Emil Querner, of the same city. These two worthies publish a pamphlet, which is circulated far and near, and which contains the following formula as the specific for cancer:

℞	Chlorate of carbon	2 oz.
	Yellow dock	2 lbs.
	Bittersweet	2 lbs.
	Comfrey	2 lbs.
	Dandelion	2 lbs.
	Blue flag	1 lb.
	Mandrake	1 lb.
	Tag alder	2 lbs.
	Alcohol 76 per cent.	q. s.
	Water	q. s.
	Sugar	32 lbs.

Proceed secundum artem to make five gallons of syrup. The chlorate of carbon is to be added to the otherwise finished syrup. Dose, teaspoonful, increased to a tablespoonful, every four hours.

The catch in this formula, as the reader will at once perceive, is the *chlorate of carbon*, which can only be obtained from this analytical chemist, at the moderate sum of $5 per pound. Dr. Garrison procured the article, and also requested its chemical formula, which was stated to be by this impostor Cl_3 C_2 (Faraday), and when examined proved to be crystallized chlorate of potassa, somewhat colored with a solution of red saunders.

COLLATED PRACTICAL RECEIPTS.

Lemon Kali.—

Take of bicarbonate of soda.
Tartaric acid, of each, ℥ ijss.
Sugar (white), ℥ xi.

All to be in the state of a fine powder, and separately dried by a gentle heat, after which they are mixed together and flavored with oil of lemon, 10 drops, and otto of rose 1 drop. Passed through a sieve and put into dry bottles well corked.

Diaphoretic Powder, Beach's.—

Take of Opium in fine powder, 1 part.
Ipecac “ “ “ 2 parts.
Camphor “ “ 4 parts.
Bitartrate of Potassa, 16 parts.

Mix. This powder is sometimes prescribed by physicians.

Tully's Powder (substitute for Dover's Powder).

Take of Sulphate of Morphine, 1 part.
Camphor, in fine powder, 28 parts.
Precipitated Carb. Lime, 21 parts.
Liquorice Root, in fine powder, 10 parts.

Mix, and pass through fine sieve.

Pulvis Sulphuris Compositus (Compound Sulphur Powder).

Take of Sulphur in fine powder, 30 parts.
Bitartrate of Potassa, in fine powder, 60 parts.
Carbonate of Magnesia, in fine powder, 25 parts.
Sugar, Lump, in fine powder, 30 parts.
Oil of Fennel, 1 part.
Mix.

Aqua Lauro-Cerasi “*Dr. Pile's* (Laurel Water).

Take of Hydrocyanic Acid, U. S. Ph. f ʒ j.
Alcohol, f ʒ ji.
Water, sufficient quantity to make f ℥ iij.
Oil Bitter Almonds, 4 drops.

TO ALL PHARMACISTS!

The undersigned, appointed at the last session of the American Pharmaceutical Association,

“A COMMITTEE ON ADULTERATIONS AND SOPHISTICATIONS,”

respectfully solicit your assistance in the matter of collecting data and information which may have a bearing upon the subject. The field is so large that the committee would scarcely be able to do justice to it alone and unaided; whilst a report embodying the information gathered from all parts of the country will be of more value than if confined to observations made in a few sections.

The chief points on which information—if possible accompanied with samples—is desired, are adulterations and sophistications of

1. Chemical preparations.
2. Articles of the Materia Medica.
3. Pharmaceutical preparations.
4. Articles of consumption and food.
5. Articles not included in the above, but having a bearing upon our profession.

In the interest of our profession, and for the purpose of discouraging, or even, if it were possible, preventing the sale and use of spurious drugs and medicines, the committee hope to receive your cordial co-operation by early advice of anything coming under your knowledge, for which due acknowledgments will be made.

Communications and samples may be sent to any one of the subscribed committee.

CHARLES RICE, Bellevue Hospital, New York City, Chairman.
EMIL SCHEFFER, 115 East Market street, Louisville, Ky.
T. N. JAMIESON, 612 Cottage Grove Avenue, Chicago, Ill.

EDITORIAL DEPARTMENT.

In resuming the editorial management of the PHARMACIST, we assure our readers that no efforts will be spared in maintaining its present standard. We hope, with the promised original contributions, to make it even more valuable than it has been. It is with great pleasure that we refer to the *original* articles in this issue, a feature we expect to maintain throughout the volume and in the future. We have made arrangements to receive monthly communications from *Vienna* during the World's Exposition, treating matters pertaining to our profession. This feature, with the contributions of other friends in different sections whom we hope to press into service, will enable us to make the pages of this journal both interesting and useful to its readers. Under the title "Collated Practical Receipts," we propose to publish formulas of such articles as may be useful to the trade, and of which the formulas are not generally known. This design cannot be made successful if the compilation is left to the editor, unaided by others. Therefore we ask the co-operation of our readers in this department who can furnish for publication such receipts and facts as they are willing to communicate.

By this exchange of knowledge, that we possess through experience and observation, we become progressive as a profession, and also derive a pecuniary benefit. To others of our readers who have an aversion to yielding the communicative pen or a horror of seeing their name in print, we would say that they also can aid us, although in another way, by interesting themselves in behalf of the journal by getting us new subscribers, thereby assisting us in defraying the large expense that such a publication is always subject to, and at the same time disseminating knowledge which is essential to the progress of pharmacy, and also in raising the standard of our profession. To any one willing to assist in this work we will cheerfully send specimen copies of the journal and appoint him a subscription agent for the section of the country in which he resides. The size of this journal has recently been enlarged; with the additional space at our command, and with the liberal promises of contributions from new element in the profession, we enter upon our duties with the hope that a new impulse will be given to Western writers, and that the talent now latent amongst us will be brought into active use. If all do what they can, there will be no lack of interest or information in future numbers of the PHARMACIST.

The committee of publication has found it desirable to engage the services of Mr. N. W. King, who has been installed as its business editor, and who will attend to the business matters of the College and of the PHARMACIST. We hope that he may be aided by our many kind friends and patrons, and that his efforts in our behalf may be crowned with success. Mr King will be found at the rooms of the College, No. 77 Dearborn street, each day, from 10 to 12 o'clock A. M., and from 2 to 4 P. M.

All communications relating to the PHARMACIST must be addressed to the Editor of the PHARMACIST, 584 State street, Chicago.

REVIEW OF BOOKS.

GRUNDLAGEN DER PHARMACEUTISCHEN WAARENKUNDE—EINLEITUNG IN DAS STUDIUM DER PHARMACOGNOSIE—VON DR. F. A. FLUECKIGER, PROFESSOR AN DER UNIVERSITÆT ZU STRASSBURG, BERLIN, 1873.

The plain title of this little work, just published in Germany, hardly conveys an idea of its contents, for these "Elements of Pharmacognosis" present a wealth of facts and observation which is surprising. The work is designed to facilitate the study of this auxiliary branch of pharmacal knowledge, exhibiting in a compendious form what is widely scattered, and giving the subject a clearness of outline which is often lost sight of in more ponderous tomes. The lucid style and versatile knowledge of the author, chain the interest of the reader even to those sections of the work which otherwise would present but dry details. "There is no want at all," says the author, in his preface, "in pharmacal literature on this branch, of works which elevate it to a science. It lays in the nature of the subject, however, that even the most ingenious presentation of it will not so much produce the satisfying impression of a complete and finished work of art, but may be compared rather to an artfully conjointed mosaic. To take out the stones of this structure, to view them in their proper light, to polish their corners and edges, to point the main ones sharper, is the attempt of the present work. Wherever in this scientific edifice a stone was wanting, or found to be not in its right place, the following lines intend relief." The systematic arrangement in which the subject is treated aids memory, what was laying around loose assumes definite shape; besides all necessary aids are given for independent investigation. On page 2 of the work, the author says: "The task of pharmacognosis consists mainly in sifting, giving scientific form to, presenting summarily and verifying all that which botany, zoology and pharmacy have to say about the bodies just mentioned. Thus it becomes a branch of knowledge alike important to pharmacy as well as medicine, though but too often slighted.

With the apothecary, a closer insight into this department becomes necessary, since with him the occupation with these materials grows to be a life's task. The practical success of pharmacy depends in a great measure upon a perfect familiarity with them and their proper use, so that a deeper penetration into this science may be expected of the pharmacist. It will redound to his honor and that of his calling, when he goes a little farther than the immediate practical interest indispensably demands. Besides, it is hardly possible to draw a sharp line between every day's duty and scientific effort, and this is not only impossible, but it is even not at all desirable. Only by a constant interchange of practice and science can pharmacy at all prosper."

We wish to see this work in the hands of every student of pharmacy. The text is illustrated by over one hundred wood-cuts, representing microscopic views, some of them seen by polarized light; they are executed in the highest style of the xylographic art, presenting great clearness in the most minute details.

In the article "Aids to Study," the author says (page 18): "To the prominent importance which must be conceded to the knowledge of the inner construction of many drugs, the necessary amount of time for the production of microscopic preparations becomes a hindrance. But it is so instructive that only in case of need, or to complete one's own labor, that microscopic specimens kept for sale are of any true use or advantage. They are, however, at present, offered in unusually attractive perfection."

A section on "Microchemical Reagents," and their preparation, completes the work.

Number 2 of Vol. 2 of *The Lens* has been received. This quarterly journal, devoted to the science of microscopy, is a great credit to the State Microscopical Society of Illinois, under whose auspices it is published. It is ably edited by S. A. Briggs, Esq., President of the Society. This number is full of interesting original matter, and we heartily recommend it to all our readers who are interested in this science. A knowledge of the microscope and its use is at present very desirable to members of the pharmacal profession, and we hope the day may not be far distant when every well-regulated pharmacy will possess a "magnifier," so that it may be an auxiliary to the apprentice in his study to master the profession. Subscription, $3 a year.

Wohler's Organic Chemistry, from the eighth German edition by Ira Remsen, M.D., Ph. D., Professor of Chemistry and Physics in Williams College, Mass. Published by Henry C. Lea. Philadelphia, 1873. 1 volume, 530 pages.

This manual of organic chemistry has passed through eight rapid successive German editions, which, if for no other reason, would recommend it favorably. The name of Wohler, which ranks second to none of the eminent chemists of Germany, certainly demands for itself the highest rank in the department of organic chemistry. And in addition to this is the excellent translation into English, with an introductory chapter on "The Constitution of Chemical Compounds," by its American author, of whose ability as a chemist and scientist we have some personal knowledge. To all who desire to keep up with the progress of organic chemistry we strongly recommend his treatise in having *real merit* as a text book to the beginner, or as a guide to those more advanced in the science. We congratulate the enterprising publisher in the acquisition of so able an author, and hope that we may frequently have the pleasure of seeing the productions of both author and publisher.

Investigations on Piperic Acid and Derivations. An Inaugural Dissertation for the attainment of the Degree of Doctor of Philosophy at the University of Gottingen. By Ira Remsen, M.D., 1870, 56 pages.

Investigations of Parasulpho Benzoic Acid, by Ira Remsen, M. D., Ph. D., 1873, 26 pages.

Civil Malpractice. A report presented to the Military Tract Medical Society, at its 15th semi-annual meeting, Jan. 1873. By M. A. McClellard, M. D. Wm. B. Keen, Cooke & Co. publishers. 1 volume, 74 pages, bound in cloth; price, $2.

This small volume is a compilation of legal cases on malpractice from court records, and is interesting to members of the medical profession who wish some information on the knotty questions of medical jurisprudence.

The annual Commencement of the Massachusetts College of Pharmacy was held on the evening of May 7th, 1873. The Vice President, Mr. Chas. A. Tufts, of Dover, N. H., conferred the degree of Graduate of Pharmacy upon W. W. Bartlett, L. C. Flanagan, F. M. Loring, Chas. P. Orne, S. C. Tozzer, and Jos. S. Whall.

TO ADVERTISERS.—We shall print an extra edition of the June number of the PHARMACIST for gratuitous distribution. All advertisements for the June number must be received previous to the 25th of May.

THE PHARMACIST.

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ON CANTHARIDAL PLASTER AND FLUID EXTRACT OF CANTHARIDES.

BY PROF. G. DRAGENDORFF OF DORPAT, RUSSIA, HONORARY MEMBER OF THE CHICAGO COLLEGE OF PHARMACY.

TRANSLATED BY R. ROTHER.

My paper on the preparation of a very active cantharidal plaster (PHARMACIST, Vol. V., p. 78) has variously occasioned a great disparity of opinion. First appeared in the August number of THE PHARMACIST, Vol. V., p. 171, an article by Mr. Rother, who, acknowledging the theoretical excellence of my process, maintains that its practical execution is attended with inconvenience and unproductive of satisfactory results. The subject was further discussed at the Twentieth Annual Meeting of the American Pharmaceutical Association. *Vide.* Proceedings, Sept. 1872, p. 61. On which occasion allusion was also made to the earlier observations of Masing and myself, regarding the activity of potassium cantharidate. I believe the negative results obtained with the prepared cantharides, made according to my directions, and partly with Squibb's cantharidal fluid extract, containing potassium cantharidate, are based almost entirely on misconceptions of the process, in part caused by myself, and these it is my present object to correct.

I commence with the objections which Mr. Rother has advanced in the article above referred to. He states, firstly, that since the quantity of potash lye requisite for a proper impregnation of the powdered cantharides, is about three times the weight of the latter, a proportionately large amount of chlorhydric acid is required for the subsequent neutralization.

Secondly, that it is difficult to dry the mass and prevent the formation of mould, and that if the powder is not perfectly dry it may also cause a rapid deterioration of the cerate prepared from it. He asserts thirdly, and finally, that the pulverization of the dried mass, preceding its incorporation with the cerate is another source of annoyance (probably owing to the presence of the large amount of the generated potassium chloride).

In regard to his first objection, I will remark that I never intended or instructed the use of so large a quantity of potash lye as applied by Mr. Rother. One hundred grm. of the powdered cantharides requires, at the utmost, but 40 grms. of the alkaline solution, sp. gr. 1.1 or 12 grm. of sp. gr. 1.36, which is amply sufficient to dissolve the whole of the cantharidin as potassium cantharidate, providing the necessary amount of water required for the production of a moderately fluid magma is also added. But to attain positive assurance of success I now recommend to subject this magma to a water bath heat at 100° C. for one hour, instead of twenty-five to thirty minutes as I at first directed. The quantity of chlorhydric acid then necessary for neutralization will be about 13 grm. of the sp. gr. 1.1234, thereby generating 6.5 grm. of potassium chloride, which here results in no way injurious, neither does it interfere with the pulverization of the dried mass.

I stated that the drying could be rapidly accomplished over a water bath at 100° C., and I found that with the use of shallow porcelain vessels, quantities from 200 grm. of powdered cantharides could be perfectly dried in this manner within twelve hours. The dried residue was easily pulverized by trituration in a mortar, and then it passed readily through an ordinary sieve. From this it is plainly evident that the formation of mould is here absolutely precluded.

The cerate made from these prepared cantharides has the following composition:

Cantharidum praeparatarum partes—8.
Digere per horam cum
Sebi ovili partibus—4
adde
Terebinthinae venetae partes—2.
Cerae flavae.
et
Colophonii singulorum partes—8.
Fiat l. a. emplastrum.

I can vouch for the activity of a plaster thus prepared. But only for this and plasters of a similar composition do I recommend the prepared cantharides.

If in the manufacture of the cerate it should be preferred to employ an oleaginous extract of the flies, then I would advise that the digestion with the oil must be conducted at a heat of about 120° C., strained at this temperature, and best immediately united with the wax before the oily extraction is permitted to cool.

The above plaster has been employed in our clinical dispensary for upwards of half a year, and not a single failure has yet occurred in its use, not even when the cerate had been kept some time, neither did it ever become mouldy.

It appears questionable to Mr. Rother whether the cantharidin isolated by this process is as soluble in fats as that existing in the unchanged cantharides. But I have no doubt whatever that it differs in no particular from ordinarily isolated cantharidin, and that it is in this form more thoroughly utilized than in its original state.

Cantharides thus prepared are, however, not applicable for making aqueous or weakly alcoholic preparations.

When, at the Twentieth Annual Meeting, Mr. Eberle relates, in evident allusion to my paper, the inefficiency of a cerate made in accordance to it, then I am not at all surprised that he met with such experience. The account given of the method plainly shows that he overlooked the most vital point of my proposition. His cerate contained potassium cantharidate, whereas I again decompose this salt with chlorhydric acid, and introduce the free cantharidin. Since potassium cantharidate is nearly insoluble in the fatty compound of the cerate, activity can scarcely be expected from it.

The preliminary treatment of powdered cantharides with oil of turpentine, before its incorporation with the cerate, as suggested by Mr. Rother, I consider very appropriate, even in case that the powder had been first prepared as proposed by me.

One objection, which, however, was not raised against my process, I will here briefly touch. It could be supposed that in drying the mass, after treatment with chlorhydric acid, a loss of cantharidin would be sustained by evaporation, which indeed is justified by fact. But the loss, as found by the experiments of Renard, under my direction, is very trifling, ("Das wirksame princip im wassrigen destillate der canthariden."—Dissert. Dorpat, 1870), as a rule, regardless whether large or small quantities of cantharidin were subjected to a temperature of 100°C., no more at the utmost than 0.0011 grm. was volatilized in one hour, and only when the cantharidin, being freshly precipitated from its solution, was rapidly brought to 100° C., was the loss greater during the first hour, once 0.003 grm., and another time 0.0037 grm., and in each case the loss fell to the usual rate (0.001 grm.) during the succeeding hour. One hundred grm. of cantharides containing 0.4 grm. of cantharidin, would, accordingly, whilst drying in ten hours, part with no more than 0.012 grm., or 2.5 per cent. of its whole amount of cantharidin.

I will finally add two remarks in relation to Rother's publication. The author gave his opinion that in the extraction of pure cantharidin, the application of alcoholic potash as a menstruum would perhaps be preferable to the use of my prepared cantharides.

I would second his proposition if potassium cantharidate were not rather difficultly soluble in alcohol. Masing found (Die Verbindungen des Cantharidins mit anorganishen Basen.—Dissert. Dorpat, 1866) that its solubility in alcohol 90 per cent. Tr., at a temperature of 15° to 20° C., was as 3 : 10000, and at the boiling point as 9 : 1000. Water dissolves at 15° to 20° C. 4.13 per cent., and at the boiling point 8.87 per cent. of potassium cantharidate.

The author further believed that ammonium cantharidate is but sparingly soluble in water, alcohol and ether. Its solubility, according to Masing, is as follows:

Water at 15° to 20° C. dissolves	1.83	per cent.
“ at the boiling point dissolves	3.45	“ “
Alcohol at 15° to 20° C. “	1.31	“ “
“ at the boiling point “	1.87	“ “
Ether dissolves	Only traces.	

Let us now pass to the main points of the discussion on this subject at the Twentieth Annual Meeting of the American Pharmaceutical Association. Dr. Squibb stated (compare also “Proceedings of the American Pharmaceutical Association of the Nineteenth Annual Meeting,” p. 457) that he found a fluid extract of cantharides, prepared with potassium hydrate, at first very active, but that later it became totally inactive, and that other observers had even found the fresh preparation worthless. The secretary believed he could explain that the difference in the activity was caused by the action of carbonic acid.

I now declare, in a general sense, that I never recommended an alkaline fluid extract of cantharides, and consequently could leave the defense of that proposition to its originators. But since the invention is intimately connected with the observations which Masing and Radecki made under my supervision, that an aqueous solution of potassium cantharidate acts as a powerful vesicant (“Die Cantharidin-vergiftung."—Dissert. Dorpat, 1866), I take the liberty of entering into a short discussion of these points.

That an aqueous solution of pure potassium cantharidate can be used as an active vesicatory will be conceded by any one who has ever experimented with this salt. It is also generally known that after Masing and myself recommended this salt as a vesicant in 1867; it has for three years back been firmly established in the French medical practice, and is also occasionally used in Germany. The salt is perfectly stable in aqueous solution, and even after long standing, retains its activity unimpaired. Carbonic acid is incapable of separating cantharidin from its solution. But Bluhm proved already, as early as 1865, that cantharidin liberates the carbonic acid, although slowly, from potassium carbonate in aqueous solution ("Beitraege zur Kenntniss des cantharidins."—Dissert. Dorpat). Dr. Squibb has so far correctly given the salification of cantharidin, in that the cantharidin, as anhydride before its combination, must first absorb the elements of water to form a union with the base. (The passage of Dr. Squibb, "It cannot exist as anhydride after having once been compounded," is probably a typographical error, and should read *hydrate* instead of *anhydride.*)

In this respect cantharidin differs from all other vesicants (anemonin, etc.), because it retains this property whether in its freshly prepared state, in combination with a base, or after its liberation from the base, when it again returns to the condition of anhydride. By experimenting with cantharidin which had been several times converted into salt, in combination with various bases, it was found, on separation, that it had not sacrificed its power in the least.

Now, in order to understand the change observed in the fluid extract of cantharides prepared by Dr. Squibb's formula, I believe it necessary to call attention to the other substances likewise extracted along with the cantharidin. I have no doubt that the fluid extract, when fresh, contains potassium cantharidate, and even in presence of the rather strong alcohol used in the extraction, may contain all the cantharidin of the flies employed. But will the cantharidin always remain in the potash compound when the fluid extract is stored away—may not the concomitant matters of the extract suffer change under the influence of potash or potash soap and generate acid decomposition products which then separate free cantharidin?

Acetic acid, for instance, could effect this. It would indeed be very expedient to have the insoluble matters which separate from the fluid extract on keeping, microscopically examined for crystals of cantharidin. I regret my inability of making observations in this respect, as the fluid extract of cantharides has not yet come in use with us.

I am under the impression that the strongly alcoholic vehicle of the potassium cantharidate in Squibb's fluid extract is not very appropriate. When applied to the epidermis the alcohol will evaporate very rapidly, even while the paper saturated with liquid is covered with oiled silk, adhesive plaster, or gutta percha. But whenever the paper once becomes dry, then the resorption of the cantharidate will only succeed where there is unusual tendency to transpiration, and then only on the condition that the paper lies firmly in contact with the cuticle.

Aqueous solutions with which patent lint or other like suitable material is saturated and then covered with rubber cloth, must in all probability be much more active. Masing produced vesication under such circumstances, when but 0.0001 grm. of the potassium salt dissolved in 300 parts of water was applied to the square centimeter of surface.

In conclusion, I will point out the uncertainty of results attending the test of vesicating compounds when performed on the human subject. It is too well known that there is scarcely another remedy in the treatment of disease for whose apparent inefficiency the apothecary is more often and unjustly blamed.

When experimenting with aqueous solutions the permeability of the skin, the greater or less transpiratory tendency of the part should always be taken into account. The same with matters soluble in fats, regarding the activity of the sebaceous glands. But in either case the closest possible contact must invariably be secured. On previous occasions, I have cautioned against applying such tests to the arm, because the muscles of the same are continually in motion, and therefore move the cover from place to place.

When applied to the body of a male, I consider the chest, in the region of the heart, the most appropriate place, as the test will here remain more quiet and firm beneath the pressure of the clothing.

SYRUP OF ORANGE RIND.

BY R. ROTHER.

The officinal syrup of orange-peel is emphatically a worthless preparation. Its very decided bitterness is alone sufficient to condemn it; but its total deficiency in real aromatic properties fully warrants the above assertion.

The paradoxical popularity of this preparation receives elucidation from the fact that fresh orange-rind possesses such an exquisitely delicious flavor. But the prescriber forgets or overlooks the important distinction in regard to flavor that exists between the moist fresh, and the dried peel. There seems to be no very decided difference, when referred to bitterness, in the two kinds of commercial orange-peel, namely, the sweet and the bitter, or curacoa. Whatever slight dissimilarity there may be in the fresh fruit rinds of citrus aurantium, the sweet orange and citrus vulgaris, bitter or Seville orange must certainly fade in the dried peels, for the writer has invariably noticed that the bitterness is always the same, whether they were purchased as sweet or bitter peel.

It is, however, highly probable that the orange-peel of the market, whether obtained under one or the other title, is nevertheless one and the same thing, and that is the peel of citrus vulgaris, curacoa, bitter or Seville orange. Therefore the designation sweet and bitter is properly dropped. Notwithstanding this, however, the imported oranges seem to be those characterized as sweet, and consequently the product of citrus aurantium. The writer, in speaking of sweet orange-peel, has reference only to the moist, fresh article, as immediately removed from the fruit, and therefore prefers to give this the appellation, orange-rind, in contradistinction to the dried bitter peel. The writer further considers that this orange-rind is the only reliable material to use in the preparation of all compounds destined to possess the flavor of orange.

Now, since it is not advisable to dry the rind and sacrifice the flavor before using it, the alternative remains to work it up at once into a protected and available form. This in regard to alcoholic preparations is easily obtained by conversion into a tincture of orange-rind, made by macerating two troy ounces of the rind with a mixture of eight fluid ounces each of strong alcohol and water. But for the preparation of syrup of orange-rind, the writer takes recourse to a different method. In the manufacture of aromatic syrups, too much stress cannot be laid on the important solvent power of syrup upon resinous and oily substances. In numerous cases the indefinite appearance between actual solution and permanent suspension can be turned to great practical account if undisturbed transparency of a preparation is not invariably made a prime consideration. Many aromatic syrups would be more palatable and fragrant if so much pains were not taken in the clarification with which the most desirable portion is wasted, through the agency of magnesium carbonate. The writer has observed that many pharmacists prepare simple aromatic syrups by mixing a strong tincture with dense syrup, either in the cold, or with the aid of heat. There is no doubt in regard to the aromatic quality of these preparations, the only objection is the possibly large proportion of alcohol thus introduced. Yet in the preparation of some of the officinal syrups all the alcohol is not always removed, as, for instance, in the syrup of tolu, which officinally contains one fluid ounce of alcohol in each pint. A fine syrup of orange-peel can also be made by mixing this tincture with syrup; the resulting preparation is, however, slightly opalescent, more especially if the tincture were made with a stronger alcohol. But the writer does not recommend such a method in this case. The syrup of orange-rind produced by the new method is, however not perfectly clear and transparent. The power of a strong solution of sugar is more thoroughly utilized than is usually done, and by this procedure a most highly aromatic product results. In this connection the writer would allude to a very peculiar phenomenon of this indistinction between actual solution and permanent or prolonged suspension. It is manifested in a mixture of oil of lemon, castor oil and alcohol. By means of a small proportion of castor oil a very concentrated solution of oil of lemon in alcohol can be made. This property is often employed in the adulteration of volatile oils, whose solubility in alcohol alone is not sufficiently great.

When certain proportions of these ingredients are mixed, a permanent solution is obtained at the ordinary temperature. But if this mixture is exposed for some time to a lower degree of warmth, or if the proportion of the constituents are changed, a part of the oily substances will separate as a perfectly transparent and clear substratum. Now on either slowly rotating or shaking the containing vessel, a perfectly clear mixture and apparently perfect solution always results. No physical indication would mark it as different from an actual solution whether violently shaken or at rest, but on repose the heavier but always clear substratum is again gradually sifted out.

The following is the process for

SYRUP OF ORANGE RIND.

Take of orange-rind 8 troy ounces;
Strong alcohol, 12 fluid ounces;
Sugar, 7 pounds avoird.
Water sufficient.

Cut the rind into small fragments; pour on 2 pints of water, and heat the mixture on a water bath for about an hour, then pour the whole upon a muslin strainer and wash the residuary fragments with several pints more of water, then press out the residue gently, bruise it to a pulp, and pour on the alcohol, previously mixed with four fluid ounces of water. Then expose the mixture to a gentle heat and evaporate slowly to about half the original volume. To the cooled residue add one avoirdupois pound of sugar, and immediately after one pint of water. Stir this mixture with a pestle thoroughly, until the sugar has dissolved, then pour the whole into a strainer and follow with water, thus washing the residue, until the strained liquid, after pressing the mass, measures four pints. In this dissolve the remaining sugar with the aid of gentle heat, and strain through muslin before the syrup cools.

The product is a finely flavored, slightly opalescent, greenish yellow syrup, free from bitterness. No magnesium carbonate was used in this process. Its presence here would be superfluous and probably injurious. The officinal syrup of orange-peel has a much deeper color, which is not due to any amount of coloring matter of the orange-peel, but results from a reaction between the tannin of the peel and traces of iron, always present in the magnesium carbonate, slight acidulation, almost entirely discharges the color of officinal syrup of orange-peel.

SOLUTIONS OF CALCIUM AND MAGNESIUM CHLORIDES FOR MINERAL WATERS.

BY R. ROTHER.

Calcium and magnesium chlorides are important agents in the preparation of mineral waters. These substances, when obtained in the usual dry condition, are never sufficiently uniform and definite for the purpose. The most reliable and much the cheapest method to obtain them in quantity is for the operator to prepare these salts himself and keep them on hand ready for immediate use in the condition of concentrated solutions. A pure moderately strong solution of either calcium or magnesium chloride is easily made by neutralizing chemically pure chlorhydric acid with a slight excess of a known quantity of calcium or magnesium carbonate. In this case the amount of either chloride can be quite accurately ascertained by calculation from the quantity of pure carbonate consumed. When the proportion of chloride in the solution has been determined, it is convenient to evaporate it to such a volume as will bear a simple relation to the weight of salt in solution as, for instance, ¾, ½, ⅓, or ¼ troy ounce in the fluid ounce.

The cheapest way above all other methods, however, where very large quantities are worked up, is to employ crude commercial material and purify the product. When this is done the process is rather more circumstantial and complicated, but not, however, to such an extent as the extraordinary impurity of the raw material would indicate.

Commercial chlorhydric acid contains arsenic. It is highly charged with sulphurous acid and is abundantly contaminated with iron. The purest commercial source of the calcium base is marble, but the most available and best adapted is ordinary caustic lime, as rich in calcium and free from magnesium as possible.

Caustic lime is most abundantly accompanied by magnesium, but numerous other bases are also present, conspicuous among which is iron. The percentage of silicium and aluminium is often considerable, and decided traces of potassium, sodium and manganese are always present, and occasionally also phosphoric acid.

For consumption in the mineral water manufacture the moderate traces of alkali metals merit no attention. At the very outset of forming a solution the arsenic of the chlorhydric acid remains in the undissolved residue as insoluble calcium arsenite. The sulphurous acid is likewise removed as insoluble calcium sulphite; the same the sulphuric acid, which resulted from oxidation of sulphurous acid, as calcium sulphate, and the iron is also thrown out in the state of monoxide. In the caustic lime the excess of this employed removes the impurities of the chlorhydric acid above enumerated. It also separates its own contaminations, namely, the silicic oxide as calcium silicate, the aluminium as aluminium hydrate or silicate. The iron and manganese first being reduced by the sulphurous oxide of the chlorhydric acid to their lowest state of oxidation remain in the residue as monoxides. The calcium phosphate remains insoluble and untouched and the potassium and sodium are more or less completely carried down with the residue as gelatinous alkaline silicates, insoluble in the strong saline solution. Unless the magnesium were present in unusually large proportion, this will also be separated as hydrate, otherwise the solution of calcium chloride will also contain a portion of the magnesium salt. It is therefore advisable to employ a sufficient excess of calcium oxide or hydrate to obliterate all these admixtures. The solution thus obtained is not yet by any means suitable for use. A most peculiar sickening odor and flavor of a sulphurous character still adheres to it which must now be extinguished. This is perfectly accomplished by treatment with pure chlorhydric acid and either potassium chlorate or chlorinated lime and application of heat. By this operation an excess of free chlorine results, and, in fact, must necessarily predominate, in order to insure an absolute deodorization. Now if this excess of chlorine be in its turn suppressed by the action of an alkaline or earthy hydrate or carbonate and heat, then chlorate, but chiefly hypochlorite will be regenerated. This leaves the solution apparently odorless, but when this product is consumed in the manufacture of mineral waters a peculiar rankness is imparted to the product, not immediately, but in the course of several days it becomes manifest. A sufficiency of some sulphite prevents this undesirable occurrence. It is not, however, the proper condition in which such an article of calcium chloride should be used, since it is evident that the rank flavor was caused in some manner by the presence of hypochlorite. Therefore, the surplus of chlorine must be converted into chloride. This is admirably effected by absorption with metallic iron, which completely takes up the chlorine and passes into the ferric state. The iron is then again perfectly removed with excess of calcium hydrate, and thus a solution of calcium chloride is procured which contains only traces of sulphate and potassium and sodium chlorides and is other wise pure and free from odorous taint and ever after remains so. To determine its strength, a weighed or measured quantity is precipitated with excess of ammonium oxalate, the precipitate washed, dried, ignited and weighed as calcium carbonate. Then by calculation, as with the use of pure chlorhydric acid and calcium carbonate, will be indicated the amount of chloride in the solution. For convenience, the solution may be evaporated to a measure or weight, which will bear some simple relation to the quantity of chloride contained in it, as above suggested.

The solution of magnesium chloride may also be prepared with the commercial acid and magnesium carbonate. The acid is treated with an excess of magnesium carbonate, the clear solution poured or filtered off, acidulated with pure chlorhydric acid, then treated with a small quantity of potassium chlorate or chlorinated lime and heated to boiling. Powdered metallic iron is then added to remove the free chlorine and the iron again separated with an excess of calcined magnesia. After filtration the solution is evaporated, if desired, and the strength adjusted by calculating the amount of chloride from the quantity of magnesium carbonate consumed. This method of determinating the magnesium chloride, is not critically accurate because the carbonate is not always uniform in composition, moreover, some magnesium is lost in the process by employing an excess which later can not be redetermined. The solution contains traces of calcium and sulphuric acid. In preparing the calcium chloride solution with caustic lime the fragments are slowly added to a portion of the acid at first until this is neutralized and an excess of lime has been added. Acid and lime are then lternately introduced, and finally a considerable excess of lime is dded and the mixture set aside to repose. The clear liquid is aftervard poured off and further treated as above directed. A large stonevare vessel, as, for instance, a crock, is most convenient in making he crude solution. The lime must be added cautiously, as the ct of solution produces considerable heat.

ON GLYCERITE OF GINGER.

BY J. B. MOORE.

There is, perhaps, no aromatic more popular or more highly prized or its therapeutic properties than ginger. And as a domestic remedy, n the form of the officinal "tincture," under the popular and wellnown title of "Essence of Ginger," there is scarely a preparation of our Pharmacopœia more extensively or more universally used. The popuarity it has acquired in this form is some evidence of its therapeutic alue. Although the "Tincture of Ginger" is, for many purposes, a ost excellent and trustworthy preparation of the drug, yet in many ases of children and delicate persons, its strongly alcoholic character isqualifies it for use, and this especially in diseases of the stomach and owels when irritation or an inflammatory condition exists. The "Syrup of Ginger," as made by the U. S. P., is too weak to possess uch medicinal value, and even in its use as a flavor it is of but trifling mportance. So there would seem to exist a necessity for a preparaion of ginger intermediate in strength, between the tincture and syrup, nd at the same time free from alcohol. The "Glycerite of Ginger," a reparation whose formula I here present, is admirably adapted to suply this want. It is about triple the strength of the officinal syrup of inger and contains no alcohol, and mixes in all proportion with water nd syrup without precipitation or turbidity.

The following is the formula and process for its preparation :

℞ Ext. Zingiber. fluid., f℥ i.
Magnes. carbon., ʒ x.
Glycerin. f℥ xvj.
Aquæ, q. s.

Mix the glycerin with an equal measure of water. Triturate the fluid extract of ginger thoroughly with the magnesium carbonate. Then add very gradually, one pint of the mixture of glycerin and water, rubbing well after each addition of liquid, and strain the mixture through strong, close muslin with strong expression. Rub the residue in like manner with the remaining part of menstruum. Then transfer the mixture to a half gallon bottle containing the expressed liquid first obtained and shake the whole vigorously together. Lastly, filter through paper, passing sufficient water through the filter to make the filtered liquid measure 32 fluid ounces.

To insure a good preparation, such as the formula and process will afford, if properly manipulated, it is necessary that some care and judgment be exercised in its manufacture. In the first place, the fluid extract of ginger, if purchased, should be of known reliable quality, or else it should be prepared by the pharmacist himself. Secondly, the fluid extract and magnesium carbonate must be thoroughly triturated together before the menstruum is added, which adding must at first be very gradual, with much rubbing after each small addition. The straining and expression directed after the incorporation of the first pint of menstrum, being a little troublesome, may be omitted, and the whole of the menstruum supplied in successive portions at once, and the whole afterwards well shaken in a bottle. But the manipulation directed in the process insures the most reliable product, and I would advise that it be carried out.

The "Glycerite of Ginger," prepared as above directed, contains the activity of 15 grains of ginger to the fluid ounce, and is about the color of sherry wine, and possesses the characteristic flavor and pungency of the ginger very strongly marked. Both of which, however, are somewhat marked and blunted by the glycerin.

It will prove an excellent corrigent addition to the various tonic, diarrhœa and stomachic mixtures. It can be associated in prescription with almost all kinds of mixtures. For pain in the stomach, accompanied by sickness, acidity or flatulence, and for many other purposes which may suggest themselves to the physician, the following formula furnishes an excellent combination, and is not an unpalatable mixture :

℞ Sodae Bicarb., ʒ j.
Liq. Morph. Sulph., ℥ ss.
Tr. Cardamom. Comp., fʒ ij.
Sp. Ammon. Aromat., fʒ ij.
Sacch. Albi. ʒ iij.
Glycerit. Zingiber., f℥ ij.
Aquæ Menth, Pip. q. s. ut ft. f℥ iv.
Sig.

For an adult, one tablespoonful as required. The physician may, of course, vary the ingredients and their proportions to suit his own views. In cases of diarrhœa and other lax conditions of the bowels, Tr. Krameriæ, Tr. Catechu, Tr. Kino or other astringent remedies may be added, and the desired quantity of Tr. Opii or Tr. Opii Camph. substituted for the Liq. Morph., as these preparations are generally preferable to morphina in astringent mixtures. In cases of diarrhœa, etc., accompanied by tenesmus, a little castor oil, say from one to two fluid drachms, will be found a valuable addition to the above. The castor oil can be formed into a smoother mixture with the other ingredients, by the addition, also, of about two drachms of powdered gum arabic. By omitting the solution of morphina from the formula as it stands, and adding one fluid ounce of Comp. Tinct. Gentian., it will form a most elegant and efficient remedy in certain forms of dyspepsia and other disordered conditions of the stomach. As an astringent addition to the above preparation, I would recommend the tincture of krameria as preferable to either the Tinct. of Catechu or Kino. It being, as far as my experience and observation has gone, not only equally efficient, therapeutically, with either of the latter preparations, but at the same time more agreeable to the taste and forms a more elegant mixture with this and other similar combinations. It is especially preferable to Tinct. Catechu in these respects. This, however, is simply the opinion of a layman. The physician will, of course, interrogate his own experience and gratify his own peculiar notions in choosing his remedies.

PHILADELPHIA, May, 1873.

LABORATORY NOTE ON QUININE WASTE.

BY F. R. WILLIAMS.

The moderate solubility of quinine in water, and especially water rendered slightly alkaline with ammonia, is the occasion of a considerable loss, when handling large quantities of quinine in the making of the compounds which requires this to be applied in the uncombined condition, as of the pure alkaloid. This takes place in a number of the officinal processes, but nowhere is a provision made to recover this waste. The quinine is always precipitated from a dilute solution with a slight excess of ammonia, and after that well washed with much water. These washings are therefore charged with quinine in quantities too great to be rejected. In consideration of the high price of this article no appreciable loss should be suffered, and the required means employed to avoid unnecessary waste.

It was found that with a very careful manipulation and the most judicious application of water, 20 grains of pure anhydrous alkaloid were lost in the washings from one troy ounce of the sulphate of quinine. This is in the neighborhood of 5½ per cent., or equal to an additional cost of nearly 16 cents per troy ounce, at the price of $2.75.

Now a method that will recover this waste must naturally be inexpensive in itself, and in its application must rather possess the character of an operation intended to secure a by-product, to obtain which no additional outlay should occur.

But we have in our case a most excellent means for this purpose. The end is accomplished by precipitating the quinine from the washings as almost insoluble tannate, a substance in every day use and for which the wholesale dealers charge a comparatively outrageous price in view of its original cheapness and ease of production. Tannate of quinine contains less than one-third of its weight of pure quinine, and this fact alone is sufficient to rank it as the cheapest of all quinine salts. By preparing this compound himself the pharmacist will capture a handsome gain otherwise the prey of the large manufacturer or the wholesale dealer.

One troy ounce of sulphate of quinine will yield nearly three troy ounces of the tannate. The best manner of preparing it is to dissolve the sulphate first in a sufficiency of dilute sulphuric acid and dilute the solution amply with water. To this an equally dilute aqueous solution of tannin is added as long as a precipitate appears. The magma is poured upon a linen strainer and the liquid is pressed out. The solid cake is then triturated with water into a moderately dilute magma, and again pressed. The sufficiently pure residue of tannate of quinine is then crushed and dried by exposure in the open air. Or another way is to wash the precipitated magma on a filter and after sufficient washing it is pressed and dried as before.

To precipitate the quinine from the alkaline washings, the same method as above applies, only the solution must first be rendered slightly acid by the addition of sulphuric acid. If the tannin solution be added to the alkaline quinine liquid, the product will be dark colored. Pharmacists will see how easily this seemingly unimportant loss can be turned into an appreciable gain, as 25 grains of sulphate of quinine will at least yield one drachm of the tannate.

ESSAY ON ACONITES AND ACONITINE.

CHEMICAL PROPERTIES OF ACONITINE.

(*Continued from page* 109.)

The identity of the different organic materials extracted up to this time from aconite root is far from being admitted. In fact, at first, the experimenters did not always make use of the same crude material. Most frequently A. Napellus was employed; but in England the Bikh of India was sometimes employed; and Hubschmann made especial experiments with A. Lupicidum. The scientists who have engaged in the study of aconitine, especially within recent years, have reached results greatly differing and even contradictory, as to the physical characters, chemical properties, and particularly as to the physiological effects of the products which they have examined. Sometimes, in fact, they obtained an amorphous material, apparently incapable of crystallization; then, more recently, a product crystallizing perfectly; and finally, both a crystalline and an amorphous substance, as in the recent experiments of Mr. Grove. Nor has variety in names for the designation of the discovered product been wanting; thus we have Aconitine, Napelline, Aconelline, Nepaline, Acolyctine, Lycoctonine, substances the individuality of which is far from being well established. And to add to the confusion, the name Napelline has been applied to two different products which are not recognized as identical, and some of the above names have yet several synonyms. It should be stated, however, that at present, after the investigations of Fluckiger, Groves, and some others, by general consent, two different principles are recognized as forming part of the generality of aconitines of commerce, the true, or German aconitine, and the false, or English aconitine. The crystallized aconitine of M. Duquesnel has been since produced.

I proceed successively to a reference to the essays which have been published in regard to these different products, and I hope to show, that in fact, they tend for the most part to the acknowledgment of but one aconitine, of which the others are but forms, of greater or less impurity.

The first researches undertaken with the purpose of clearing up the confused understanding in regard to the active principle of aconite date from 1851. Schroff at that time established the fact that all the species of that genus of plants contain two distinct, active principles, both equally poisonous, of which one is purely narcotic, the other is acrid. The relative proportions of these two principles are subject to great variation, depending upon the age of the plant, climatic conditions influencing it, its state of growth, whether cultivated or wild, and especially upon the species. The A. lycoctonum would be the richest of all in narcotic principles, which existed in it almost exclusively, whilst the A. ferox would abound in acrid principle; the other species would be ranged after these in an order of decreasing activity, as follows: A. Napellus, variegatum, Stoerekianum paniculatum and anthora. The results of the investigations of Schroff are at present seriously called in question, I think, by the facts which Messrs. Hooker and Thompson have advanced relative to the variations in the toxic activity of A. ferox, Napellus and heterophylum correlative with the conditions of development of the plant.

After the appearance of Schroff's paper, chemists sought to confirm his conclusions in attempts to extract from the aconites and to isolate the narcotic and acrid principle, the individual existence of which had been established especially by physiological experiments. At this period the aconitine of Geiger and Hesse was studied chemically by Berthemot, De Planta, Dragendorff and others. In the opinion of Messrs. Fluckiger and Gastell it is the only preparation which has been used for a long time on the continent, and especially in Germany. Within a few years past, Hubschmann and Fluckiger have verified some of the observations made concerning its properties by their predecessors.

This aconitine is pulverulent, white, very light, inodorous, amorphous. Its taste is very bitter, burning, but not acrid (Fluckiger.) Boiling water softens it when it forms into a mass, capable of being kneaded, which, upon cooling, becomes hard and fragile. It dissolves in 150 parts of cold water and in 50 parts of boiling water (Geiger); in 2 parts of ether, 26 parts of chloroform (Hubschmann), and in 5 parts of alcohol at 75° C. It dissolves in amylic alcohol, but not at all in oil of petroleum; slowly in benzine. All of its solutions have a decided alkaline reaction, and upon evaporation leave the aconitine in the condition of a colorless, vitreous mass, having no action on polarised light. The aqueous solution is not precipitated by the bichloride of platinum, but it is by the iodohydragyrate of potassa.

Nitric acid dissolves it without discoloration, but sulphuric acid, which also dissolves it, colors it yellow, changing into a dirty violet, or, according to Schroff, it is colored a deep brown, passing gradually into a brownish red. Potassa, even when warm, does not dissolve it. When it is cautiously warmed in dilute phosphoric acid a violet color characteristic of this alkaloid is gradually developed (Van Bagg). Herbst (*Recherche des Poisons*, *Otto*) has given in minute detail all the precautions which are necessary to be taken in order to obtain this reaction, which is said to be very capricious. With certainty M. Fluckiger states that the discoloration may remain an entire day. Dilute sulphuric acid employed in the same way produces a similar discoloration, but phosphoric acid is preferable, because the first produces the same color with many other alkaloids. Schroff, considering the want of constancy with which this reaction of aconitine is produced, concluded that the discoloration was due not to the alkaloid, but to an impurity which did not constantly accompany it.

Two other substances, Delphine and Digitaline are colored like aconitine under the influence of phosphoric acid oxydizing agents, particularly the mixture of sulphuric acid and binoxyde of manganese produce no reaction with aconitine (Thompson.) This alkaloid, obtained by evaporation from an ethereal solution, or by precipitation in a boiling liquor, is anhydrous. Its formula is $C_{60}H_{47}AzO_{14}$ (Stahlschmidt).

Precipitated from a cold acqueous solution, it is hydrated and contains 20 or 25 per cent. of water. (Hottol. Codex.) It becomes anhydrous at 80°–85° C (Hottol) and then commences to melt. It turns brown at +120°C and disengages ammonia (Hottol); at 140°C its decomposition becomes more rapid, and traces of the alkaloid are dissipated rather than volatalized. Finally, at a still more elevated temperature it decomposes, inflames and leaves a char which soon entirely disappears, Grey and Otto state that aconitine does not sublimate, no sublimate being distinguishable even upon a microscopic slide.

Aconitine neutralizes the acids perfectly. and produces, according to Geiger and Planta, only uncrystallizable salts, non-deliquescent, soluble in water and alcohol. Fluckiger, has, however, the nitrate well crystallized. Planta has prepared a bichlorohydrate, and Fluckiger a monochlorohydrate.

The aqueous solution of this salt conducts with reagents as follows:

With Alkalies: A white precipitate insoluble in an excess of the reagent;

With Carbonate of Ammonia: Phosphate of Soda; no precipitate;

With Tincture of Iodine, and Iodide of Potassium: A crimson precipitate;

With Phosphomolybdic Acid: A clear yellow precipitate;

With Tannic Acid: A precipitate which, according to Fluckiger, only forms when the liquor is acid; it forms, on the contrary, in a neutral liquor and dissolves promptly in acid and alkaline solutions. Hottel);

With Bichloride of Mercury, Sulph. cyanide of potassium: A white precipitate;

With Picric Acid: A sulphur yellow precipitate, soluble in ammonia;

With Cadmopotassic Iodide: A white precipitate forming in acid liquors, soluble in an excess of the reagent. (Marme);

With Iodo-bismuthate of potassa, a precipitate forming in acid liquors. (Dragendorff);

With Chloride of Gold: A lemon yellow precipitate, insoluble in hydrochloric acid melting under heat and crystallizing from alcoholic solutions. (Hottoll);

With Platinocyanide of Potassium: A heavy white precipitate. This aconitine has been known as the German or Swiss article; Fluckiger proposed to call it *true* aconitine.

(*To be continued.*)

THE PEPSIN MUDDLE.

BY E. SCHEFFER.

The article of Mr. Rother, on the manufacture of pepsin, in the March number of THE PHARMACIST, has roused the bile of a certain P. L. Milleman beyond his control, which prompts me to add a few words to his "Pepsin Muddle."

In his experiments Mr. Rother differs essentially from me about the manufacture of pepsin. While my aim has been from the first to prepare pepsin in as pure a state as possible, regardless of the quantity of product, Mr. Rother seems to care principally for the quantity, and does evidently not care for the quality, and by doing so falls back in the old way, to give to materia medica a preparation containing, besides the pepsin, a large quantity of mucus, a still larger quantity of pepton, not to speak of the impurity contained in the common salt, which will inevitably enter into his preparation by his procedure.

I have given in my Essay, February, 1872, hints that will enable any scientifically inclined practical pharmacist, who is willing to experiment in order to overcome certain difficulties, to prepare a pure product.

But it seems that Mr. Rother had the intention, with his published article, to cast on me the odium of usurous prices, which might be deserved if I would work by his formula, and did not furnish a better preparation.

Mr. Rother says: *He adds so much milk sugar to his preparation that the final weight of the mixture is equal to ten times the weight of the* REAL PEPSIN contained in it, and as he obtained from six stomachs forty ounces of saccharated pepsin, he obtained from the six stomachs four ounces of *real pepsin.* I must congratulate Mr. Rother on his discovery that the mucous membrane of the hog stomach is all pepsin. At least such must be inferred, for if Mr. Rother had gone to the trouble to dissect off that part of the mucous membrane which contains the laab glands, and had dried that membrane, he would have found the dried membrane of six stomachs to weigh hardly four ounces.

Why not dry the mucous membrane at once, Mr. Rother, and thus avoid all the tedoius labor attending the washing, cleaning, cutting and extracting of the stomachs, and the precipitating, straining, pressing, rubbing, and mixing of the pepsin. By doing so you will furthermore secure a product free from the impurities introduced by the common salt, as employed by you.

The effect of Mr. Rother's article is already plainly seen in P. L. Milleman's expectorations.

And now, Mr. Milleman, *I wish to know with what degree of justice* and right you make such an awful noise in your "Pepsin Muddle." If my pepsin is too high-priced for you, why do you not prepare it yourself? In your article you show so plainly that you are the man to enlighten the world, and possibly you might improve Mr. Rother's method, and give to the public the startling discovery that not only the stomach, but the entire hog is pepsin. You are so much in favor of mucus that a portion of dirt more or less would just be the desideratum for you.

But no doubt, your possible discoveries make you shrink from such a task, as it seems to me already that the combined experiments of Rother and Scheffer have acted fearfully on your brain. My experiments of the great digestive strength of pure pepsin, and Rother's proof of the enormous amount of pepsin in the animal stomach, impressed you, no doubt, with fear that your inside might ultimately dissolve you into a mere nothing, and what pity if such a great lumen were lost to science, especially if by the instrumentality of two colleagues, one of whom is a prolific writer, and the other one an obscure druggist.

It is hard to say what shines more brilliantly in P. L. Milleman's "Pepsin Muddle"—his impudence or his ignorance. To bring the names of learned men in his writings, does not imply that the writer is a scholar. As Mr. Milleman could not make himself known by knowledge he prefers to do so by impudence and boldness.

But, nevertheless, I do not envy him for the great luminosity that emanates from him, not even if its rays should extend to Sirius. I am well satisfied in my obscurity.

PURE! PEPSIN.

BY PHILIP L. MILLEMAN.

The Sphinx is vanquished, the enigma solved, and the modern Oedipus victoriously occupies the scene. The physiological riddle is smashed, and the theory of Liebig, that digestive action is merely the propagation of eremacausis, excited by the decomposing epithelium, is knocked into a cocked hat. With one grand swoop the resistless penetration of undying Scheffer has severed the gordian knot of physiology, and the virgin *pure* idolized *pepsin* is ours, a thing of beauty and a fraud for ever.

Scheffer, the intellectual Titan, combined the herculean power of the gladiator with the perspicuity of the metaphysical sophist, jammed his scientific forearm into the seclusive stomach of the docile hog, and, with his almost rationally endowed digits, groped for, seized and extricated therefrom, not Jonah, nor the whale, but something infinitely more romantic than either—Pure! pepsin. This immaculate entity he did not find enormously numerous, yet the intense perceptive faculty of the savan of the future instantly recognized it with an intuitive conception bordering on sublimity, as his glorifying conquest, palpably—Pure! pepsin.

The brilliant effusion of astronomical knowledge, conjoined to chemical research (which is one of the distinguishing characteristics of the chemistry of the future, now under the sole supervision of the immortal Scheffer), as we behold in the astrological perturbation of the noted scientists' equilibrium, indicates that not only original experimental feats lent lustre to the discovery, but that the most intricately prophetic agencies were also at work in its revelation, only, however, with the remarkable distinction, expressive of a backward tendency in the direction, not towards the fixed stars conglomerated in the sidereal zone of Louisville, but among the scientific literary achievements of the eastern luminous belts, looming up beyond the realms of Oceano's sway.

After the glycerinical foray of our heroic pioneer, we are again astounded and *enlightened* by further *hints*, this time of *precipitated* pure! pepsin (*Jour. of Pharmacy*, Jan., 1871). How much the pharmacal profession in particular, and scientific advancement in general, profited by this wonderful exposition will never be known in its total extent. The glorifying climax of this prodigious assumption culminates in the telling *hint* that, according to the views of this precious delineator, the pharmacal profession at large must be the most unmitigated lot of asses linked within the Darwinian cycle. Ennobling, highly elevating, complimentary concatenation, based, undoubtedly, upon sound deductions flowing from the self-contemplation of his own august physiognomy. Yet the magnanimous, philanthropic, and almost self-sacrificing Scheffer not only earned his own innate satisfaction, but also a mighty Te Deum, emanating from the united and joyous acclamation of the great pharmacal world, for this disinterested display of sordid motives, so fruitful of important results to the great human family.

Hint No. 2 appeared in the *Journal of Pharmacy*, Feb., 1872, as I had mentioned in my previous paper on the pepsin muddle, surrounded with an additional halo of glory for the devoted martyr of science. He therein made infinitesimal allusion that certain *hints* were derived from original experiments, but which were, in all probability, borrowed from Gmelins' Handbook of Chemistry, and that he, the honest, unwary Scheffer, allowed the path of rectitude to mislead him—only just a little. He immediately recovered himself from the onslaught of truthful emotions, and vindicated the unlimited superiority of his product by a quotation from the "*Author of Gmelins' Handbook*," as he supposed, which, however, the editorial staff superintending the publication of this serial for the Cavendish Society inserted from a paper by Guibourt, published in some French pharmacal journal.

Now the eternally remembered Scheffer is so kind and obliging to say that he never did in reality publish his exact process, which even now remains safely protected within the secluding spheroidal circumference of his impenetrable skull. The produce prepared according to his presumed method is horridly impure, charged with *mucus*, PEPTON, and the various impurities of the common salt, whatever these may be.

It must, consequently, be worthless, or nearly so, and no one should fail hereafter to import it directly from Louisville, in bond, *via* ærial navigation line, so as to have undoubted assurance that the pure! pepsin had not been contaminated by earthly things since it left the superdivine sanctuary of the god-like Scheffer.

How inexcusably stupid it was for Meissner to find that parapepton which Eichwald subsequently proved identical with syntonin, should be so radically distinct from Lehmann's pepton proper; that whilst the first is precipitated from its acidulated solution by most of the neutral salines, the pepton of Lehmann peremptorily refuses to follow the noble example, the eminent Scheffer's expressed wishes to the contrary notwithstanding. Most inobedient pepton, thou shalt, therefore, as a condign punishment for thy evil intent, for ever remain in thy acidulated solution, in spite of all the sodic chloride of this mundane globe; and thou vicious mucus, where remaineth thy recreant presence, knowest thou not what exhorteth the irrevocable Scheffer?

Pure! Pepsin even now its power stands against the world; servile to its master's faintest hint—the stepping-stone to his transcendant triumph. Thank we the lucky star (be it Sirius Oh! Cæsar Scheffer, which thou likenest so precisely, fixed, its constant ray sheds the supremacy of sunshine upon the hosts of lesser lights about) beneath whose benign influence we were ushered into this vale of tears. Our most futurious progeny will revert to that golden era with special gusto to think that one of their ancestors at least could personally recount the many weighty scientific acts of this illustrious contemporary. The learned precepts of that incomparable philosopher have inculcated the doctrines of the chemistry of the future within the cranii of his adoring disciples. Our voracity for this most coveted mental food has now been fully sated. The incomprehensible Scheffer hath said, we are all ears, and have learned a thing or two, which is all we wanted to know, and for which we are most humbly yours forever. O! matchless tutor! When Mulder and Bruecke found that active digestive fluids could be obtained so free from albuminoids that the proteic reaction failed to put in its presence, and that neither Millon's solution nor the alkaline cupric oxide test could bring forth a response; then the Samaritan Scheffer hands the suffering populace a Pure! pepsin which gives these reactions with such atrocious reality that a somewhat unbalanced mind could easily be led to doubt its own existence, providing the infallible Scheffer could hold his own thereabouts. The wondrous power of that Pure! pepsin has seized upon the pharmacal multitude. Just imagine, for instance, when Scheffer cautions against the disastrous effects of an overdose of pure pepsin, what an unspeakably exciting theme this would create for the morbid proclivities of the fatalist. And I must say that I was myself so thoroughly imbued with this humane impulse of the gentle Scheffer, that I forthwith became contagiously affected, and whilst laboring under the inspiration made the greatest psychological and physiological discovery of the age, second only to unfathomable Scheffer's own doings.

Eureka! Scheffer and I have got it. The mysterious disappearance of individuals every now and then is unrefutably elucidated. These unhappy wretches, whilst suffering with a peculiar indigestion (for which the original genius Scheffer will have to invent a new technical term), brought on from a lack of appropriate victuals, the Pure! pepsin so rapidly augments that the lamentable subjects of this disorder are speedily dissolved out of existence. Yes; and now, who must we blame for this abominable condition of society? The execrable Scheffer, of course. "Pud 'im out, ride avay guick!" That Pure! pepsin done it; and this obdurate being finds contentment in obscurity. Oh, wicked Scheffer, and yet thou art happy!

STUDIES OF THE MATERIA MEDICA OF THE CHINESE.

EXTRACT FROM A REPORT ON THE INVESTIGATION OF M. M. LEON SOUBEIRAN AND DABRY DE THIERSANT, MADE TO L'ACADAMIE DE MEDECINE. BY M. A. GUBLER.

TRANSLATED BY CHARLES C. FREDIGKE.

(*Continued from page* 146.)

The theoretical ideas of our antipodes, often conforming to those which guide us, are generally more rational and more advanced than one should expect. By the side of the somewhat obsolete doctrine of specifics glide physiological ideas evidently more modern. For instance, in several passages the affirmation of the pathological conditions of fluids is met with. An undetermined *Bignonia* repairs alterations of the blood, while rhubarb has the power not only to prevent its corruption, but also to render it fluid if it was coagulated.

But naturally, the solids are the seat of the more habitual lesion, and because each of the main medicaments chooses, so to say, one or several of the more important viscera, this permits of modifying separately the diverse parts of the organism by appropriate means. Yet sometimes the active substance, like that of a certain *Carduns*, penetrates simultaneously what Chinese medicine calls the *twelve ways*, and affects at the same time the entire economy.

In the same manner the elimination of poisons, and consequently that of remedies, is effected by special ways; this allows, the case happening, to conduct outward the morbific matter; hence the idea of treating hydrophobia by grasshoppers, which render it abortive, in order to expulse the pretended *canine fœtus*, meaning the virus considered as a living being. Unfortunately, if the premises are correct, the conclusion is contestable, and the corollary is absolutely inadmissible.

Chinese physicians have recognized that there are antagonistic substances, that such substances are incompatible in the same formula, and that they can serve reciprocally as antidotes. They recommend, also, to avoid the association of Ta-Ky (a species of *Carduns* above mentioned) with *Glycyrrhiza*, *Chamædaphne*, and *Helminthocorton;* whereas they advise to treat the stings of wasps, scorpions, and even the bites of venomous serpents, by means of *Bidens parviflora*, to administer *Nelumbo* to those who are poisoned by crabs, and to combat the toxical effects of mushrooms by alum or the root of *Cichorium*, and those of aconite by *Libanotis*.

According to them, arsenic should find an efficient counter-poison in *Pharseolus angulatus*, which would make one think that this species, belonging to an inoffensive genus, should possess exceptionally a pharmaco-dynamic activity, comparable to that of the Calabar bean, and superior to that of another leguminous plant, *Cytisus Laburnum*, the toxical properties of which are probably analogous to those of the exotic Pharseolus.

In order to complete our programme we need only to describe some particulars which indicate a nice and acute observation on the part of the Chinese. Of this number are the favorable effects of malted barley in troubles of digestion, and the resolving action exerted by nitre and muriate of ammonia in opacity of the cornea. Another fact of considerable import has been observed by them; the immunity, with reference to goitre, of those who make use of water preserved in vessels of lead, and the possibility of preventing this degeneration by administering saturnine preparations.

Finally, we will point out to the attention of therapeutists some substances much esteemed in the extreme Orient, and which, without being all heroic medicaments, will merit, nevertheless, to be subjected to an experimental test on animals, and to close clinical observation. Such are *Anemarrhena asphodelœdes*, employed for the same purposes as squills; *Pardanthus chinensis*, to which are attributed the most remarkable and varied properties; *Pupalia geniculata*, the acrid and sialalogue root of which is used in rheumatism, etc.; *Passerina Chamoedaphne*, the tincture of which is often employed as a cordial, tonic and febrifuge: *Rehmannia chinensis*, useful in general debility; *Dimorphanthus edulis*, frequently prescribed against loss of blood, diseases of the heart, and others; *gynocordia odorata*, the seeds of which are praised against dermatocles and syphilis; and among the febrifuges, *Tournefortia argusina*, *Trichosanthes dioica*, and above all, *Dichroa febrifuga*, the reputation of which is great in Cochin China, and which will doubtless deserve, more than the former, the title of substitute for quinine.

Such are, gentlemen, the main facts, discovered by your commission, in the materia medica of the Chinese; such are also the deductions, which we believed could be drawn, in reference to the actual state and doctrinal tendencies of Chinese medicine.

The academy is now enabled to appreciate the considerable importance and high value of the conscientious and learned work submitted to our examination, and we hope that it will participate in the opinion of its commissioners, comprised in the following terms:

The *Etudes* of MM. Leon Soubeiran, and Dabry de Thiersant, *Sur la Matiere Medicale des Chinois*, constitute a progress with regard to anterior publications.

Without having resolved all the difficulties, or dissipated all doubts, their labor is certainly the most correct and the most complete on that part of medical knowledge.

By the mass of facts which are here found united, as well as their importance and their novelty, this work offers a great attraction to scientific curiosity, and cannot fail to serve as a base for ulterior and decisive researches, having for their purpose the elucidation of all questions pertaining to the history of medicine among the nations of the extreme Orient.

Consequently, gentlemen, your commission does not hesitate to submit the following conclusions for the approbation of the academy:

1. To thank the authors for their very interesting communication.
2. To congratulate them on the results obtained and to encourage them to persevere in the laborious and eminently useful researches which they have undertaken.
3. To recommend MM. Leon Soubeiran et Dabry de Thiersant to the consideration of the Minister of Public Instruction, with a view to obtain the printing, at the expense of the State, of their learned work, entitled: *Etudes sur la Matiere Medicale des Chinois.*

M. Gubler adds, in closing, that the commission might well conclude the printing of this work in the memoirs of the academy, but a particular difficulty was presenting itself; the Chinese names ought to be reproduced in Chinese characters, and the national printing establishment alone possessed these types. It is necessary, then, to recur to the State, and this is at the instance of the Minister of Public Instruction. M. Gubler hoped that the report of the commission would contribute to raise these difficulties.

Some days after the communication of the report of M. Gubler, the Minister of Public Instruction, in deference to the wishes of the academy, gave orders for the immediate printing of the work of MM. Soubeiran et Dabry de Thiersant.—*Journ. de Pharm. et de Chem.* 4 *serie.* (*Fevrier*, 1873.)

GLYCERIN IN FLUID EXTRACTS.

BY WILLIAM C. GILL.

(*Extracted from an Inaugural Essay.*)

Sixteen troy ounces of valerian root, reduced to proper form, was exhausted and made into fluid extract in the usual manner; the result was a clear reddish-brown preparation, odor and taste strong of valerian, and indicating a good extract. Another sixteen troy ounces was treated, after Mr. Campbell's process, with a menstruum consisting of alcohol, three parts; glycerin, one part. The fluid extract obtained was of a very dark reddish-brown color, with the characteristic odor and taste, but to all outward appearance much stronger than the preceding. Both preparations were labelled, dated and set aside. At the expiration of five weeks the fluid extract containing glycerin had changed to a muddy liquid, very unsightly and with considerable precipitate; the other, on the contrary, remained clear, with but a very slight precipitate. The glycerin preparation was then filtered; the filtered liquid again presenting a beautiful clear appearance, and seeming to have lost but little of its strength, and by many would have been pronounced the best preparation of the two. In this instance the glycerin served merely to dissolve the coloring matter (which it was unable afterwards to hold up), and thus placed the preparation in a false light, giving rise to what by a vulgar expression is called "strong," simply on account of its depth of color.

Similar experiments were made with buchu, cubebs, lupulin, and ginger. In the first three the result was very nearly the same as with the valerian, namely, a strong-looking preparation, but one which in each instance precipitated after standing some time. In fact, with the cubebs and lupulin it was apparent that glycerin was not at all suitable, while the buchu yielded, instead of the rich green color noticed in the alcoholic fluid extract, a preparation having a brownish hue. The fluid extract of ginger made with the addition of glycerin was, however, superior to that simply made with alcohol, not only presenting a much nicer appearance, and proving on dilution to be equally as strong, but remaining permanent.

While performing these few experiments with the above well-known drugs, an order was received for fluid extract of poke root. Having previously used diluted alcohol as a menstruum, and with considerable success, we thought to improve on the same by addition of glycerin. A dark reddish-brown preparation was the result, coming up fully to our expectations; and, feeling perfectly satisfied, we placed what remained on hand after filling the order, on a shelf. On going to the bottle some three weeks after we found, on examination, the extract had gelatinized, and was in a semi-solid condition. Since then we have noticed a similar change in several other fluid extracts which were stable before glycerin was used in preparing them, yellow dock, golden seal, and elecampane being among the number.

In making the above statements we do not wish to condemn the use of glycerin in fluid extracts; on the contrary, we rather approve of it; but its indiscriminate use, as recommended by many, we do certainly disapprove of. In many cases the use of glycerin seems specially called for. In the fluid extract of senega it appears to be the only preservative; for, no matter what menstruum we use, if glycerin is omitted the preparation will precipitate, while if this liquid is used in the proportion of one-fourth to the usual menstruum, a fluid extract is obtained which will remain permanent, but with very slight precipitation, for an indefinite period.

The above observations are more of a practical than experimental nature, and are, perhaps, a little at variance with the ideas generally published; though adding nothing new to our knowledge of glycerin, they show that we must be guarded in its use, and carefully study the composition of the drug before using it as a menstrum.—*Am. Journal of Pharmacy.*

Mr. Edw. Z. Gross, in an inaugural essay presented to the Philadelphia College of Pharmacy, and published in the *American Journal of Pharmacy* for May, states that he has succeeded in isolating a crystalline principle, to which he has given the name *Coptina;* he also discovered the presence of berberina.

In another inaugural essay by John Henry Flint, presented to the same college, and published in the *American Journal of Pharmacy* for the same month, on Arctostaphylos Glauca (Manzanita). The author in his investigation isolated a crystalline principle which he claims identical with *Arbutin*, from uva ursi.

DETECTION OF THE SUBSTITUTION OF CARBOLIC ACID FOR CREASOTE.

BY JOHN A. CLARK, GUELPH.

In the *Can. Pharm. Journal.* No. 12, vol. 5, there is a communication from Mr. Morson, London, on the substitution of carbolic acid for creasote. He states that there is no good test for distinguishing between the two, but proposes the use of glycerine, in which carbolic acid is easily soluble, but creasote insoluble. A far better test is the alcoholic solution of perchloride iron (or Tr. Ferri Perchlor B. P.,) which, when added to an alcoholic solution of creasote, produces a "dark greenish-blue" color, but with an alcoholic solution of carbolic acid only a "light brown" coloration. By this test 1 part of creasote in 500 parts carbolic acid ean be easily detected. But the adulteration of creasote by carbolic acid is more difficult to detect, but can be ascertained in the following way: Boil a few drops of creasote with nitric acid (about 2 drs.) until red fumes are no longer evolved, this yields a solution, which, when neutralized with solution of caustic potash gives *no precipitate*, the creasote forming oxalic acid. Carbolic acid, when treated in the same manner, is very violently acted on by nitric acid and forms picric acid (trinitro-phenylic acid) which, when neutralized with solution of potassa give a "yellow crystalline" precipitate. 1 part of carbolic acid in 50 parts creasote can be readily detected in this way. —*Can. Pharm. Journal.*

PRELIMINARY NOTICE OF A NEW SALT OF QUININE.

QUININE MECONATE.

BY PETER TOWNSEND AUSTEN, PH. B.

As a salt of quinine and meconic acid has not to my knowledge been before described, I attempted to prepare one.

If an alcoholic solution of meconic acid be added to an alcoholic solution of quinine, a white, curdy precipitate is formed. The precipitate is soluble in hot water, being deposited on cooling in beautiful crystals. The water solution gives reactions for both quinine and meconic acid. The first curdy precipitate on drying forms a mass resembling dried glue, the next precipitate forms minute scales of a silken lustre. Finally, small crystals are obtained. When filtered and dried on bibulous paper, the salt has a peculiar sheen, resembling minute fish scales.

A direct estimation of quinine was made as follows: A weighed portion of the dried salt was dissolved in water by the aid of heat, the quinine was precipitated by ammonia and dissolved in ether. The ethereal solution was separated from the ammoniacal liquid and washed with water by means of a stopcock funnel, after which it was evaporated and weighed. Though the greatest care was observed in the washing, a loss of quinine occurred.

Salt.	Quinine.	Found.	Calculated.
.25 grm.	.137 grm.	54.8 per cent.	56.66 per cent.

The composition of the salt is then most probably

$$C_7H_2(C_{20}H_{24}N_2O_2)''O_7,$$

which corresponds to the silver salt $C_7H_2Ag_2O_7$.—*Am. Chemist.*

PHARMACAL MEETINGS.

CHICAGO COLLEGE OF PHARMACY.—ADJOURNED REGULAR MEETING OF THE COLLEGE, HELD MAY 14, 1873.

There were present Messrs. Mill, Ebert, Fuller, Hooper, Hambright, Wilson, Borland, Buck, Jamieson, Fredigke, Borcherdt and Patterson.

The President and Vice Presidents being absent, Mr. Geo. M. Hambright was elected chairman.

By a vote of the College the Secretary was directed to drop the following names from the roll of membership, for non-payment of dues: W. C. Badeau, S. F. Poorman, Adolph Waller, Daniel Kevane, C. H. Fitch, E. G. Muller, T. N. Holden, D. Henan, H. T. O. Farrell, M. McDermott, J. S. Hunt, Fred B. Power; and the vouchers for the same, to the amount of $135, were ordered to be destroyed.

The Secretary's report was then read, showing that there had been received $611; balance on March, 1872, $143.84; amount in arrears, $95; orders drawn on treasurer, $799. Roll contains—city members, 71; country, 31; honorary, 19.

On motion, it was received and placed on file.

On motion, it was ordered that a corrected list of the membership of this College be published in the July number of the PHARMACIST.

On motion of the lecture committee, it was voted that graduates in pharmacy and medicine be admitted to the lectures in this College on the payment of the matriculation fee.

A motion prevailed requesting Prof. H. H. Babcock to deliver one lecture each week during the entire lecture season.

On motion, the article relating to qualifications for graduation be amended by striking out the words "the drug business," and inserting "a pharmacy or drug store, where the prescriptions of medical practitioners are dispensed." Also read "Dean of the Faculty," in place of "Secretary of the College."

A motion prevailed directing the Secretary to request the Convention of Teaching Colleges of Pharmacy to adopt a uniform code of ethics.

A motion prevailed requesting the Finance Committee to meet the late Secretary and Treasurer, and audit their accounts at an early day.

On motion the College adjourned to meet the second Wednesday in June. T. H. PATTERSON, Secy.

MINUTES OF STATED MEETING OF THE BOARD OF TRUSTEES OF THE COLLEGE OF PHARMACY OF THE CITY OF NEW YORK, HELD MAY 1ST, 1873.

The meeting was called to order by the President, Mr. WM. HEGEMAN.

After reading and approving the minutes of the last meeting, and receiving the Treasurer's and Secretary's reports, the board proceeded to the consideration of certain recommendations of the Lecture Committee, relating to the advertising of the College Course, and the organization of the Summer Course in Practical Botany and Analytical Chemistry. The expenditure of a sum of money adequate to the latter purpose was authorized.

A resolution was offered by Mr. Rice, to have the arrangements for the lectures of each course hereafter made in the month of January, to enable the Lecture Committee to issue the prospectus early in the spring. On motion of Mr. Peixotto it was voted to lay this resolution before the next meeting of the members of the College.

Having attended to various other business, on motion of Mr. Balluff, seconded by Mr. Peixotto, the Secretary was directed to send short extracts of the minutes to the *N. Y. Druggists' Circular; Journal of Pharmacy*, Philadelphia, Pa.; and THE PHARMACIST, Chicago, Ill.

The board then adjourned.

H. A. CASSEBEER, Jr., Secy.

ORGANIZATION OF THE TENNESSEE PHARMACEUTICAL ASSOCIATION.

By an invitation from the Tennessee College of Pharmacy to the drug trade of the State, a convention was held on the 14th and 15th of May, at Nashville.

The following gentlemen were present: Benj. Lillard, J. M. Davidge, W. H. Leckhardt, Thomas Black, of Nashville; R. D. McCauley, of Clarksville; Wm. Byrne, of Jasper; Wm. M. Bowman, J. C. Wharton, James Thomas, Jr., J. B. Haddox, W. D. Kline, of Nashville; B. H.

Owen, Clarksville; Joseph Richards, W. W. Berry, Jr., Boyd Murrey, Horatio Berry, W. J. Bright, A. H. Coussens, D. D. Phillips, G. H. McMurrey, S. S. Wharton, J. P. Watkins, G. L. Cowan, H. M. McConnell, J. R. Harwell, S. M. Demoville, R. H. Gordon, A. W. Wharton, W. G. Ewing, Taylor Harwell, of Nashville; and George W. Albers, of Knoxville.

On motion of Mr. Thomas, the convention organized, to be known as the Tennessee Pharmaceutical Association, and J. C. Wharton was elected temporary Chairman.

Benj. Lillard was elected temporary Secretary, and R. E. Page temporary Treasurer.

On motion of Mr. Thomas, the following resolution was passed, viz.:

Resolved, That a committee of three be appointed to prepare a suitable address to the druggists in the State, inviting them to attend a meeting of the association to be held during the State Fair next fall, or when the Chairman and Secretary may select, urging upon them the importance of their becoming members, and extending their aid and influence to it.

The following were appointed on the committee: R. H. Gordon, B. Haddox, Thomas Black.

On motion of R. McCauley, the chair appointed the following committee on constitution and by-laws, to report at the next meeting: W. D. Kline, Benj. Lillard, W. H. Leckhardt, R. E. Page, James Thomas, Jr., J. M. Davidge.

On motion of Mr. Lillard the Chair appointed the following committee to prepare a petition to Congress asking the repeal of the stamp tax, and tax on alcohol when used in connection with our business, and that the same be sent to all the druggists and physicians in the State for signature, W. D. Kline, B. Willard, W. H. Leckhardt.

Mr. R. D. McCauley offered the following resolution, which was adopted:

Resolved, That this association takes pleasure in informing the druggists throughout the State of the organization of the "Tennessee College of Pharmacy," and heartily commend it to their support and encouragement.

The Chair appointed the following Committee of Reception to receive the visiting members at the next meeting: James Thomas, S. S. Wharton, N. F. Dortch.

The association then adjourned to meet as previously arranged.

NOTICE OF MEETINGS.

Meeting of the Chicago College of Pharmacy.

The adjourned annual meeting of the College will take place on June 11th, at 3 o'clock P.M., at the rooms of the College, No. 77 Dearborn Street. All members are requested to be present, as matters relating to changes in the By-Laws, reports of Finance and Lecture

Committee, and other important business pertaining to the future management of the college, will be acted on.

By order of THEO. H. PATTERSON, Secy.

The Attfield Testimonial has arrived and will be presented to the the Chicago College of Pharmacy at the meeting of June 11th instant. All members are requested to be present.

By order of Committee on Testimonial.

AMERICAN PHARMACEUTICAL ASSOCIATION.

Office of the Permanent Secretary, 145 North Tenth St.,
Philadelphia, May, 1873.

The twenty-first annual meeting will be held on the 16th of Sept. next, in the city of Richmond, Va. The exhibitions of objects relating to pharmacy which have been held for years past simultaneously with the meetings of the association, have been growing in interest and importance. A similar exhibition is contemplated for the next meeting, which will be the first one south of Washington, D. C., and from present appearances promises to be a large and interesting one. Pharmacists, druggists, manufacturers, dealers in druggists' articles, &c., are therefore cordially invited to prepare for this exhibition and to notify the undersigned, as early as possible, of the space desired, whether table or floor room.

Articles of the following classes are especially appropriate: 1. Crude drugs and derivatives; 2. Pharmaceutical preparations; 3. Chemical preparations; 4. Pharmaceutical and chemical apparatus and appliances; 5. Shop fixture, soda water apparatus, &c.; 6. Druggists' sundries, new toilet and fancy articles; 7. Plants—officinal, useful and ornamental; 8. Pharmaceutical and chemical literature, new and rare books.

Further particulars will be made known by circular in July.

Your co-operation for the above object is respectfully and earnestly invited.

Yours very respectfully,

JOHN M. MAISCH, Permanent Secy.

EDITORIAL DEPARTMENT.

ACCORDING to the statement made in our May number, we have published an extra edition of THE PHARMACIST this month, with the purpose of distributing these extra copies to members of the trade whose names are not as yet on our subscription list. We hope that many who receive this gratuitous specimen copy will find it of such intrinsic value to themselves that they will send us their names and the subscription price of $1.50. The consideration, pecuniarily speaking, certainly is small to each individual, but to us the aggregate is of vital importance in successfully publishing a journal of this character.

We need this aid, more especially if we are to be successful to withstand the tempting offers of quacks to advertise their nostrums. Many good journals of high standing are to be found, who, for the want of the proper support from the profession they represent, have, to make both ends meet, succumbed to the necessity financially, in inserting the advertisements of these vultures who prey on the misery of humanity, and thereby give them what they are so much in want of, and above all so much desire, *an appearance of respectability*. It is, therefore, in the power of the profession to say whether they desire a publication of an instructive and useful character, or simply an advertising sheet to extol the extraordinary qualities of goods of a doubtful character, and which generally finds its proper place among waste paper.

We freely offer our columns to Pharmacal Associations and Colleges of Pharmacy for the publication of their reports and transactions, and all we ask in return is, that they encourage their members to aid the good cause in subscribing to *all* the pharmacal journals published in this country, the number of which is not very large, and the annual expense is, comparatively speaking, very small. Let all work with a will in raising the standard of the profession. Let us all pull together, for, in things essential, we should be a unit, and "onwards and upwards" our motto.

The controversy which has ensued in our pages on Pepsin and its "Muddle" has been one of words only, and the pharmacal profession has not been benefited either intellectually or pecuniarily. Therefore, gentlemen, if you have only shallow words, please bury the hatchet, and whenever you have any *facts* to communicate that are really valuable to your co-laborers in the profession, the pages of THE PHARMACIST are freely open to you. Until then let us have peace. "So mote it be."

NOTICE.—The Publishing Committee announce with regret a necessary change in the *personnel* of the management of this journal, the retirement of the business editor. No confusion will result from this change, if our correspondents have observed the notice of this committee that *all* communications should be addressed to the Editor of the Pharmacist, who is a permanent officer of the College. All official acts relating to the College or to the journal will bear the endorsement of some one of its officers.

BOOKS RECEIVED.

The Obstetrical Journal of Great Britain and Ireland, with an American supplement. We are in receipt of the first number of this journal devoted especially to the science of gynæcology, and what we can judge from its first appearance it will rank with the best of the medical journals of this country. It is a monthly of 88 pages, at $5.00 a year. William F. Jenks, M.D., is its American editor, and is published by Henry C. Lea, Philadelphia. Volume, commencing with the April number.

THE PHARMACIST.

VOL. VI. CHICAGO, JULY, 1873. NO. 7.

PEPSIN.

BY R. ROTHER.

The intricate problems of physiological chemistry embrace the utmost reach of chemical science. The greatest exponents of scientific progress have grappled them in their obscurest depths, and although the light of genius has illumined the tortuous path of inquiry, still that branch of chemistry involving directly the profound questions of physiology, is yet in its initial state. The discussions relating to subjects under this section of science are closely confined to their own peculiar sphere. The complication of theories, resting upon interminable hypotheses, and the mysteriously problematical nature of the ground, are menacing barriers, exclusive to all save the powerful intellects endowed with indomitable perseverance, conjoined to an almost self-sacrificing devotion for such extremely unpromising pursuits.

The literature of this department does not partake of the popular character. Its transcendental quality and laborious volume adapt it better for special study in extended detail. The results and accounts of these investigations are mostly published in the form of independent works, from which the epitomized facts often only in the shape of remote allusions, are transferred to the dictionaries on general chemistry, elementary treatises and special text-books.

Current pharmaceutical literature rarely contains such essays, so destitute of interest to the general reader on pharmacy. Physiological subjects, however, become important in this connection, when they have a direct practical bearing upon the commercial interest of the business. Therefore, pharmaceutical publications had been rather mute on the Pepsin question, until pepsin became a commercial article. Even then, the field was barren of positive knowledge, and only a few vague speculations on the industrial production of this elusive and incomprehensible agent were scattered among the voluminous literature on pharmacy. Anterior to 1869, the excellent paper of W. S. Squire, in the British Pharmaceutical Journal of 1857, on commercial pepsin, and that of A. Cushman, in the proceedings of the American Pharmaceutical Association of 1859, are the only ones of value. Mr. Squire mentions four articles of commercial pepsin: No. 1, acidified with lactic acid; No. 2, which contains in addition one per cent. hydrochlorate of morphia; No. 3, containing ¼ per cent. strychnine, and No. 4, which contains no lactic acid. In that journal of 1865, appears another paper on the same subject by F. Vincer, which, however, is inconsistent, contradictory and valueless.

But the scientific history of pepsin in its physiological bearing is simply immense, notwithstanding that even now the absolutely pure body is probably not known.

The most available sources of information on the chemistry of pepsin and its physiological relations, are the condensed paragraphs of "Gmelin's Hand-book of Chemistry," "Watts' Dictionary of Chemistry," and "Liebig, Poggendorf, and Wöhler's Hand Wörterbuch der chemie." These compendious works relate in greater or less detail, the most important achievements and noted opinions of all the illustrious investigators in this branch of science. In them will be found, under the headings of Pepsin, Proteïds, Gastric Juice, Digestion, Nutrition, &c., the comprehensive outlines and special results of the earliest researches, and the most elaborate and latest investigations.

But amidst this stupendous aggregation of labor and thought, studded with the brilliant gems of the greatest intellects, will be met the most annihilating contradictions, and a confusion of misinterpreted results, that is perfectly amazing. The positive theorems of scientists, established, no doubt upon sound deductions from apparently the clearest evidence, are again absolutely crushed by the diametrically opposed results drawn from the more refined methods of analysis, or differently instituted systems of research of others.

The writer has, in order to fully elucidate the motives which prompted this effort, gathered the results of the best authorities on this subject, and gives, in the numerous quotations which follow, the discoveries and opinions of such scientists as Lehmann, Bidder, Schmidt, Meissner, Mulder, Frerichs, Eichwald, Brücke, Liebig, Wasmann, Schwann, Kühne, Hoppe-Seyler and numerous others, concerning the properties of Pepsin, and the proteïn bodies.

Our knowledge of the existence of Pepsin dates from 1834. Since that time, this important agent of the animal economy has been the constant study of physiologists; but so subtle is this principle, that although its manifestations are of a most powerful and decided character, yet the body in an isolated and absolutely pure state has probably never been obtained.

As an article of pharmacy it has long been in use, but it is only quite recently that we were enabled to procure it in a more definite and reliable form.

The conversion of food into blood and tissues is effected through a series of chemical and molecular changes, with the agency of certain secretions furnished by the organs of digestion. The function of these organs upon food, preparatory to assimilation, is termed digestion.

In 1834, the results of Eberle's researches on artificial digestion, first indicated the existence of a distinct digestive principle, which in the presence of free acid determined the solution of coagulated proteïn bodies.

Eberle found that infusions of the gastric glands or the mucous membrane of the stomach, when slightly acidulated with chlorhydric acid, at the normal temperature of the body, also possessed the property of exerting a digestive action upon the proteïds, exterior to the organism.

In 1836, Schwann isolated the principle and named it pepsin. He obtained a precipitate from the gastric fluid by means of mercuric chloride, which, after separation of the mercury, in an acidified solution, possessed a powerful digestive force.

Wasmann, in 1839, extracted the mucous membrane of hog's stomach by successive macerations in distilled water until putrefaction began. The resulting viscid neutral liquids were then precipitated with plumbic acetate, and the precipitate when freed from lead, yielded pepsin in solution. This was now carefully concentrated and treated with alcohol, which again completely precipitated the pepsin in a flocculent form. Wasmann ascertained that this pepsin when dissolved in 60,000 parts of water acidulated with chlorhydric acid, dissolved coagulated albumin in 6 to 8 hours, and that it also was an equally powerful digestive of bone cartilage and gelateginous tissue. He noticed that a small quantity of mineral acid rendered the aqueous solution turbid, which an augmentation of the acid again cleared. He likewise made the important observation that alkalis destroy the digestive property of pepsin, and that higher temperature also had a destructive effect.

Pappenheim found that ferrous and cupric sulphates and other salts precipitated pepsin, and that the precipitate is again soluble in an excess of some of these re-agents.

Bidder and Schmidt, in 1852, obtained pepsin by neutralizing gastric juice with lime-water, filtering, evaporating to a syrupy consistence, and precipitating with alcohol. The precipitate was re-dissolved in water, and again thrown down with a large excess of mercuric chloride; the mercury removed with hydric sulphide, and the solution evaporated to dryness.

C. Schmidt advanced the theory, supported by interesting analogies, that the true digestive principle was a combination of Wasmann's pepsin and chlorhydric acid. This acidulous couplet he termed pepsin-hydrochloric or pepto-chlorhydric acid. He assumed it to be a definite compound, containing uniform proportions of its two constituents. Meissner took the view that this theory is substantially aided by the favorable experiment when liquid albumin is poured into very weak chlorhydric acid, containing 0.2 per cent., the albumin, after standing some time is largely precipitated on neutralization of the liquid, and the more the longer the action of the acid has endured, but, in the presence of pepsin, the effect of the acid is greatly subdued, and with a sufficient amount of pepsin, no precipitation whatever takes place. It seems therefore that a certain proportion of pepsin was required to annul this action of the acid entirely.

Schmidt also proved beyond a doubt that the acidity of gastric juice is due to the presence of free chlorhydric acid. He found that the chlorine precipitated from the peptic fluid by means of argentic nitrate, was more than sufficient to combine with all the bases present. And it was further shown by Meissner that, whilst 0.1 to 0.2 per cent. of chlorhydric acid was ample for the production of an active digestive fluid, with a like amount of pepsin, 1 to 2 per cent. of lactic acid was needed to produce the same result, and even then the energy was always feeble, compared with that of chlorhydric acid. Phosphoric, oxalic, tartaric, succinic, acetic, nitric, and sulphuric acids, are nearly or totally inactive; likewise acid calcium phosphate.

Lehmann first taught that the acidulated pepsin changes the albuminous bodies into new products, called by him peptons. According to the eminent physiologists, Bidder and Schmidt, gastric juice is the most abundant secretion of the body. In twenty-four hours, about fifteen pounds avoirdupois is generated by the stomach of an average man; and yet, "the conversion of the proteïn bodies into peptons is not completed in the stomach, a large portion of the albuminous constituents of the food passing unaltered into the intestines, where their conversion into peptons is completed by the action of the intestinal juice. The quantity of gastric fluid secreted is not sufficient to effect the solution of the proteïn matter required for nutrition. That the intestinal juice is capable of digesting these bodies, is proved by the experiments of Bidder and Schmidt, who found that pieces of flesh and coagulated albumin, introduced into tied loops of intestine, were digested in from six to fourteen hours; also, that the pure alkaline intestinal juice, as well as that secretion mixed with bile and pancreatic juice, possesses the power of dissolving proteïn substances externally to the body."

Meissner further showed that the peptons of Lehmann, resulting from the gastric metamorphosis of the proteïds, were a complex mixture, and that the process of digestion was by no means as simple as might be supposed. Meissner attempted to establish the existence of a great number of these transition products, and even claimed that a number of them were final products of digestive action. Caseïn, when treated with acidulated pepsin, is partially converted into a white insoluble residue, becoming still more insoluble under the prolonged effect of the diluted acid. This residue Meissner named dyspepton. When the liquid portion is now neutralized, another precipitate occurs; and when this method of acidulation, occasionally encountered by a neutralization, is several times repeated upon the successive liquids, other precipitates are obtained, to which Meissner applies the names parapepton, metapepton, and a, b, and c pepton. But Brücke and Mulder have conclusively demonstrated that pepton is the only final product into which the proteïds are ultimately converted under the continued influence of pepsin. The complicated system of Meissner originated in mistaking the mixtures of syntonin (parapepton) with albumin and pepton for distinct bodies.

Lehmann found that the peptons derived from the different proteïds were not all exactly identical. But it is now known that the substance which Meissner called parapepton is identical with syntonin or muscle fibrin.

"Syntonin was discovered by Liebig, and named by Lehmann. Kühne showed that syntonin does not exist, ready-formed, in fresh alkaline muscular fibre, but is formed from the myosin contained therein, by the action of very dilute hydrochloric acid.

"According to Kühne's precedent, the products resulting from the action of dilute acids on soluble or coagulated albuminous substances, and on fibrin, are now all reckoned as syntonin. According to Hoppe-Seyler, water throws down hydrochlorate of syntonin from solutions of all albuminous substances in strong hydrochloric acid. Syntonin occurs in blood (Eichwald), in the fluid of the stomach, probably as the first product of the action of the gastric juice on albuminous substances. In artificial digestion, it is formed before peptons.

"Fibrin, or coagulated egg albumin, is dissolved in fuming hydrochloric acid; the filtrate is precipitated with water, and the precipitate is collected, pressed, dissolved in water, and again precipitated by careful addition of soda (Hoppe-Seyler.) It forms a moist, coherent, somewhat elastic, white mass (Lehmann); when freshly precipitated, gelatinous flocks (Hoppe-Seyler). Rotates a ray of polarized light to the left.

"Syntonin is insoluble in water (Meissner). It dissolves easily in hydrochloric acid of 0.1 per cent. (Liebig). The solution is rendered opalescent by excess of hydrochloric acid (Lehmann). It does not coagulate on boiling; but when syntonin is boiled with water, it becomes insoluble—or soluble, with difficulty, in hydrochloric acid of 0.1 per cent. (Kühne).

"Syntonin does not dissolve in an aqueous solution of nitrate of potassa containing 6 per cent. of the salt, nor in solution of chloride of sodium, dilute or concentrated. Moreover, chloride of sodium and other salts throw down, from its solution in hydrochloric acid, a curdy precipitate soluble in a large quantity of water (Liebig). Chloride of sodium, chloride of ammonium, sulphate of soda, sulphate of magnesia, and chloride of calcium, render cold, dilute solutions of syntonin turbid, and form, with strong solutions, a thick jelly, from which white flocks are deposited on boiling (Kuhne).

"Syntonin dissolved in hydrochloric acid coagulates, when the solution is neutralized, to a thick white jelly, which dissolves easily in excess of alkalis (Liebig). Moist syntonin is easily soluble in aqueous ammonia. The solution is not precipitated by carbonic acid, or by the addition of other acids to neutral or acid reaction. It is completely coagulated by heat when exactly neutralized; but incompletely when a slight excess of acid or alkali is present. The liquid coagulable by heat is also precipitated by water. An ammoniacal solution, strongly acidified with acetic acid, is completely precipitated by mixing it with an equal bulk of a solution of chloride of sodium (Eichwald).

"Syntonin dissolves in very dilute solutions of alkaline carbonates (Kühne.) In moderately strong carbonate of potash, it swells up to a jelly, which dissolves only after considerable dilution (Lehmann).

"The solution of syntonin in aqueous carbonate of soda, containing one per cent. of the salt, does not coagulate on boiling (Kühne). The alkaline solution is precipitated by nitric acid (Lehmann), and by carbonic acid even in presence of alkaline phosphates (Hoppe-Seyler), (Eichwald). Sulphate of soda scarcely precipitates the solution in carbonate of soda, even on boiling; but chloride of sodium, chloride of ammonium mixed with sulphate of magnesia, and chloride of ammonium alone (which salts render the solution only slightly turbid in the cold), throw down solid white flocks on boiling (Kühne). Chloride of sodium and sulphate of magnesia precipitate the alkaline solution only on boiling; but after the solution has been heated to the boiling point, they precipitate even in the cold (Lehmann).

"The precipitate produced by neutralizing aqueous hydrochlorate of syntonin dissolves in lime-water if it has not been boiled with water. The solution coagulates on boiling like diluted albumin (Liebig). A solution of syntonin in lime or baryta water, froths strongly when boiled; on prolonged boiling, the froth is deposited in the form of transparent flocks, without much syntonin being precipitated. The solution is precipitated by chloride of sodium at the boiling heat, but not in the cold; sulphate of soda causes no precipitate, even on boiling; chloride of ammonium a slight precipitate in both cases; sulphate of magnesia and chloride of calcium precipitate only the hot solution. These reactions are not altered by boiling the syntonin solution, and then leaving it to cool (Kühne).

"Syntonin forms, with strong, acetic acid, a jelly which does not dissolve completely in water (Hoppe-Seyler). Ferrocyanide of potassium throws down, from acetate of syntonin, a precipitate free from potash (Boedeker)."

"In natural or artificial digestion, which presupposes the presence of pepsin and free acid, albuminous substances are converted, first into syntonin and ultimately into peptons. According to Eichwald, these peptons also occur in small quantity in the blood, and in larger quantity in old colloid sacs."

"The peptons cannot be produced by the action of dilute mineral acids, in the absence of pepsin, at the temperature of the body, but the change may be brought about by prolonged boiling either with dilute acids or with distilled water (Brücke, 1861). The action of ozone also gives rise to similar products (Gorup-Bezanez). In dilute hydrochloric acid alone, fibrin merely swells up, dissolving only after several days at the temperature of 20° C., whereas in hydrochloric acid containing 0.4 per cent. in presence of pepsin, it is rapidly resolved into flocks, which dissolve to a turbid liquid. This solution deposits syntonin (Meissner's parapepton) when neutralized. It is not rendered turbid by boiling when it has been prepared with boiled fibrin, but when made with unboiled fibrin, it contains a body which is coagulated by boiling, probably an albuminous substance enclosed in the fibrin. When digestion has proceeded farther, the solution is no longer precipitated by neutralization, the syntonin being then converted into pepton (Brücke)."

"Pepton is obtained from a solution of coagulated albumin in acidulated water and pepsin containing no more unconverted syntonin, and which therefore is no longer affected by neutralization with ammonia or by ferrocyanide of potassium or strong mineral acids, by treatment with plumbic acetate and the careful addition of ammonia until the pepton is deposited in flocks, and the supernated neutral or feebly acid liquid is no longer precipitated by plumbic acetate. The precipitate is washed, suspended in slightly ammoniacal water, and decomposed by sulphydric acid; and the filtrate from the lead sulphide is concentrated and then precipitated by absolute alcohol (Eichwald)."

"According to Eichwald, the peptons obtained from different albuminous substances are probably identical; he distinguishes, however, the pepton obtained from mucin from albumin pepton. Mulder distinguishes the pepton of gelatigenous tissues from other peptons; it is not precipitable by chloride of mercury, and is not colored by Millon's mercury solution, or by boiling with nitric acid, or by supersaturation with ammonia."

"Albumin pepton forms white delicate flocks, or after drying, a yellow, brittle, very hygroscopic mass, containing a very small quantity of ash (Eichwald). The aqueous solution diffuses very easily through parchment paper. It dissolves very easily in water, forming a solution which is not affected by boiling, or by acids, alkalis, or concentrated solutions of salts, or by ferrocyanide of potassium and acetic acid. The solution acquires a yellow color when mixed with strong nitric acid or with ammonia; and produces, with Millon's mercury solution, brown flocks, which turn red on warming.

"Neutral (not acid) solutions of pepton are precipitated immediately when strong, and after standing some time when more dilute; white by plumbic acetate, yellowish brown by ferric chloride, white by mercuric chloride, yellow by bichloride of platinum, and white, gradually turning dark brown, by silver salts. Neutral or faintly acid, but not alkaline solutions, give brown flocculent precipitates with tannic acid. Alcohol precipitates pepton from neutral, but not from acid or alkaline solutions (Eichwald)."

"Pepsin prepared by Wasmann's method was from its reactions judged to be a proteïn body. But Mulder obtained artificial digestive fluids, free from proteïc reactions, and quite recently (1861) Brücke has been able to prepare pepsin in a state of greater purity. An infusion of the glandular layer of the stomach, made with dilute tribasic phosphoric acid, is filtered and neutralized with lime-water. The bulky precipitate of calcic phosphate, which carries down with it mechanically the greater part of the pepsin, is collected, washed, pressed, and treated with dilute hydrochloric acid. The solution is again precipitated by lime-water, and the deposite again dissolved in dilute acid. To this second solution is gradually added, by means of a long funnel reaching down to the bottom of the vessel, a saturated solution of cholesterin in a mixture of one part ether and four parts alcohol, and the whole is well shaken. The cholesterin with the mechanically entangled pepsin is separated by filtration, well washed and treated with ether. The ether holding the cholesterin in solution is then poured off, and the remaining liquid filtered. The filtrate, which when feebly acidified acts very energetically on proteïn bodies, gives no precipitate with mineral acids, tannin, or mercuric chloride, and only a turbidity with acetates of lead. It gives no xantho-proteïc reaction, and is not colored by sulphuric acid and sugar, or by strong hydrochloric acid. Pepsin appears, therefore, not to be a proteïn body.

"Pepsin is only active in dilute acid solution. It is apparently more active in conjunction with hydrochloric acid than with lactic or other acids. A too high or too low a degree of acidity is injurious, 0.08—0.2 per cent. of hydrochloric acid being about the most suitable."

"Neutralization suspends, without destroying the action of a dilute acid solution. Strong alkalis seem, however, to injure pepsin."

"Pepsin appears not to be used up or consumed during digestion; that which is poured into the alimentary canal during digestion, passes out in part by the urine after it has done its work, and may be recovered from that fluid. Brücke found it also in flesh."

"Pepsin, as secreted in the so-called peptic glands of the stomach, is neutral; the secretion becomes acid in the ducts of the glands (Brücke)."

"In an alkaline solution pepsin soon becomes putrid, and in a neutral solution it seems to give rise to the formation of fungi, but when rendered acid, it remains unaltered for a long time, exactly like natural gastric juice."

"According to Dr. Pavy, the neutralization of the free acid of the gastric juice by an alkali, is the cause which prevents the stomach of a living animal from being acted upon and dissolved by its own secretion. During life, the walls of the stomach are very freely permeated by a current of blood, which in its normal state, is always alkaline, and therefore neutralizes the acid in the gastric juice, and protects the stomach from its action. After death, however, the blood becomes stagnant and incapable of supplying the alkali with the same rapidity as a circulating current; consequently in many cases, especially when death is sudden or violent, and the gastric juice healthy and vigorous, the stomach is found to be dissolved even to the extent of perforation."

"Von Wittich employs a modification of Grünhagen's method. He determines the total amount of the products of digestion by the læva-rotation of polarized light in a Soleil-Ventzke's apparatus, and the amount of peptons formed, by neutralizing the liquid so as to precipitate parapeptons, and again noting its rotatory power. He now finds that pepsin may be extracted from gastric mucous membrane after it has been steeped in alcohol, or from the precipitate which is produced in glycerin extract of fresh mucous membrane by the addition of alcohol. The glycerin must, however, be allowed to remain in contact with the mucous membrane or precipitate for several days. He is not certain whether pepsin is albuminous or not. It does not give the reactions of albumin. It differs from albuminous substances in resisting putrefaction; it agrees with them in being almost entirely indiffusible into distilled water. It diffuses, however, very rapidly into dilute hydrochloric acid containing 0.2 per cent. of acid. He thinks this is due to the formation of a diffusible compound with the acid. Fibrin absorbs pepsin most energetically. When put into water into which pepsin can dialyse, it causes it to pass through the parchment more quickly. An excess of fibrin will absorb from artificial gastric juice all the pepsin which has already digested a part of it, and when the undissolved fibrin is taken out and put into fresh acid, the pepsin it contains is generally sufficient to dissolve both it and additional fibrin added to it, while the liquid from which it has been removed has lost all peptic properties. When, however, fibrin is digested upon a filter, the pepsin runs from the filter together with the products of digestion, so that the amount of pepsin remaining with the fibrin on the filter gradually diminishes, and its digestion in consequence becomes slower. This circumstance, as well as the fact that pepsin becomes diffusible in presence of free acid, causes him to believe that the process of digestion begins by pepsin forming a loose chemical compound with the acid, and that this compound is the active agent in the process. He considers that they combine in definite proportions. Deficiency of acid will stop digestion, although pepsin be present. He finds that the activity of an undiluted glycerin solution was retained after an exposure to a temperature of 80° C., for 2 minutes.

When digestion stops in presence of pepsin and fibrin, it is due either to the want of free acid, or the accumulation of the products of digestion. The presence of water is necessary to digestion ; an insufficient quantity retards the action of pepsin. Digestion is arrested by the accumulation of the products of digestion, and especially of peptons. It is impeded by the presence of 4.3 per cent. and probably stopped by 6 or 8.6 per cent."

In a summary of all the authenticated results of these investigations we find the following incontestably established facts : That the preliminary stage of digestive action, consisting in the solution of the coagulated proteïds, is effected through the agency of a distinct and positive entity—pepsin, and not as Liebig supposed, by the contagious action of the decomposing epithelium,—corroborated and ascertained by the researches of Eberle, in 1834.

Schwann, Wasmann, and Bidder and Schmidt succeeded in isolating pepsin in a more or less impure condition, and Wasmann found that after a final precipitation with alcohol, one part of that pepsin dissolved in 60,000 parts of acidulated water, still gave the evidences of digestive power.

Pappenheim found that pepsin was precipitable by various saline solutions, and again soluble in an excess of some of them.

C. Schmidt, sustained by Meissner, showed that pepsin can only act on albumin in the presence of free acid, and that, moreover, chlorhydric acid can only exercise this normal function, as no other acid can satisfactorily take its place, in the total absence of chlorides.

Lehmann found that pepsin converts the proteïn bodies into new products, of which the first and last of the series are syntonin and pepton, as shown by Meissner, Mulder, Eichwald, Kühne, Brücke, and others.

Gastric juice has no action on horn-tissue, compact, elastic membranes, wax and its varieties, fats, cellulose, and the woody structure of vegetable cell formations; and merely as an ordinary solvent, unattended by chemical or molecular decomposition, does it act on the carbohydrates soluble in water, namely, saccharose and its modifications, dextrin and gums.

Although gastric juice has no action on fatty matters, nevertheless the presence of fat in moderate proportion remarkably aids in the peptic conversion of albuminoids. But the change of the original proteïds into pepton is not completed in the stomach. The pepsin generated by the peptic follicles is barely half sufficient for that purpose. The digestion of the unaltered albumin is completed by the intestinal secretion; and as Bidder and Schmidt found that the gastric secretion amounts to fifteen pounds avoirdupois in twenty-four hours, and allowing that only one-third per cent. of this is pepsin, we have the total of 350 grains of this substance. Then even that is only half of what would be needed to convert all the syntonin into pepton before passing out of the stomach. The normal produce of pepsin is great, and as its digestive power is equally great, it would seem as though nature had miscalculated somewhere. But this anomaly is explained from the results of Brücke, that pepsin is almost entirely removed from its solution by various finely-divided bodies in a state of suspension, as, for instance, sulphur, animal charcoal, and calcium phosphate. This is further substantiated by the observation of Von Wittich, in that coagulated albumin absorbs pepsin completely and energetically from its solution; and as it was further ascertained that the course of gastric digestion requires a period of between three and four hours, during which time the products of digestion are constantly passing through the pyloric orifice into the commencement of the intestinal tube, consequently portions of the pepsin will continually pass out of the stomach along with the chymified matters. The expulsion of chyme at first is moderate; but towards the close of the process, it is very rapid, indeed. Therefore, at the completion of the gastric digestion, the stomach will be nearly empty of food-matters and the generated pepsin which the process had required. The augmentation of the free chlorhydric acid is also greater towards the end of the digestive action, which seems to be entirely in conformity with the requirements of the process of digestion.

The generation of so large a quantity of pepsin is not surprising, in view of the fact that the membranous layer of the stomach is one mass of gastric follicles, aggregating in the number of five millions, and requiring but a moderate activity to secrete fifteen pounds avoirdupois of liquid in twenty-four hours.

According to Frerichs, raw flesh is less easily digested than boiled or roasted, and that the flesh of old animals requires more time than that of young, owing to the solid integument surrounding the primitive bundles of the muscular fibre; but that unboiled albumin is much more easily digested than that which is boiled.

Syntonin, the first product of gastric action, is precipitated by neutralizing its acid solution, or by treatment with strong solution of neutral salts, prominent among which is sodium chloride. Therefore, if the solution of albuminoids in natural or artificial gastric juice is treated with a strong solution of sodium chloride, the unconverted syntonin will precipitate, carrying the pepsin along with it.

But if the syntonin has been perfectly transformed into pepton, the strong saline solution will cause no precipitate, because pepton is soluble in acidulated strong saline solutions. However, the pepsin, free from syntonin, will be precipitated, whilst the pepton remains in solution. If the acid liquid, free from syntonin, is treated with alcohol, the pepton will likewise remain in solution, as the pepsin precipitates.

Pepsin prepared by the processes anterior to 1861, is necessarily contaminated with albuminoids, because the agents employed for its elimination also separated with it albumin, syntonin, and pepton; and since the product gave the proteic reactions, it was classed as a proteïn body. But Brücke obtained pepsin free from proteïc reaction, which did not give the usual characteristic indications of ordinary pepsin, with the exception of undiminished digestive power; and since Mulder also obtained digestive fluids free from proteïc reaction, pepsin was no longer considered a proteïd.

Mr. Scheffer's first appearance in connection with the pepsin industry dates from March, 1870. The essay he published at that time in the *American Journal of Pharmacy* contained nothing new. It could well be characterized as a cheeky rehash of Mr. Long's excellent article on the same subject, published originally in the *Dublin Medical Press and Circular*, and republished in the PHARMACIST about six months previous to the publication of Mr. Scheffer's article. With characteristic audacity, Mr. Scheffer assumed to be entirely original, and, without any circumstances, deliberately claimed the application of glycerin as his own invention. It seems, however, that even Mr. Long was not the first who used glycerin for this purpose; for we find that Mr. A. Cushman, in 1859, had already employed it for making a glycerole of pepsin, for which, however, he gave no process in the paper on pepsin which was published in the proceedings of the American Pharmaceutical Association, in 1859.

Mr. Scheffer, in order to appear scientific, gives in his first paper the results of an investigation of the comparative value of commercial pepsins, and really finds—which must speak volumes for the scientific ardor of Mr. Scheffer—that Houghton's pepsin does actually contain pepsin; for he found that one drachm of Houghton's pepsin in one fluid ounce of water acidulated with fifteen drops of muriatic acid—did, in fact, dissolve ten grains of coagulated albumin out of the sixty originally employed. This astonishing result in the face of all the evidence in the world, that Houghton's pepsin is a vile nostrum which contains no pepsin (a fact long known to the profession—which, moreover, the writer has found to be a mixture of sugar of milk and strychnine), is so insipidly puerile that it leaves one in doubt whether Scheffer is joking, or imagines that all pharmacists are fools.

In Mr. Scheffer's second article, published January, 1871, in the *American Journal of Pharmacy*, he says, among numerous other things, that, "of the different formulas given in divers books treating upon organic and physiological chemistry, I found the one by which the pepsin is precipitated by alcohol the least suitable, as the pepsin obtained in this way had, after being dried, lost its solvent power on albumin."

Mr. Scheffer then proceeds to state that he *precipitates* pepsin, presses out most of the adhering water, mixes the yet moist residue with sugar of milk, dries it completely, and then dilutes the mixture with more sugar of milk, so that ten parts of the final mixture shall represent one grain of pepsin. He names the product saccharated pepsin. Ten grains of saccharated pepsin dissolve, according to directions, 120 grains of coagulated albumin in four hours.

He then finds it necessary to explain that, "as the normal gastric juice of man and animals contains chloride of sodium, I tried to ascertain if the addition of a little table-salt to a solution of unmixed pepsin in acidulated water would accelerate the solution of coagulated albumin; the result was, that pepsin, with chloride of sodium, dissolves albumin much quicker than without it. I therefore mention here that chloride of sodium is added to the saccharated pepsin."

Mr. Scheffer again compares his saccharated pepsin with the pepsin of other manufacturers, and finds, among a number of pepsins examined, that his is equal to at least forty parts of Houghton's and twelve of Hawley's. This shows that J. S. Hawley's pepsin fared a trifle better at his hands than Houghton's, which is rather surprising, as the half-dozen bottles of Hawley's pepsin that the writer has seen opened were all alike—a pasty, grayish-looking mass, in the last stages of putrefaction; nevertheless, the villainous compound may still have contained some active pepsin, unless the solution of the albumin was effected by the contagious transfer of the abnormal decay.

In the March number of the *American Journal of Pharmacy*, of 1871, Mr. J. S. Hawley finds himself compelled to express his intense grief at this, to him, deeply injurious result of Scheffer's analysis; but can not forbear to grant the tribute which one kindred genius owes the other, and says:

"Scheffer's article bears intrinsic evidence of candor and scientific accuracy."

Some credit is, however, due to Mr. Hawley for his excellent method of ascertaining the amount of albumin actually dissolved in the process of assay. He first dries a portion of the coagulated albumin to be employed, and finds that one part of the dry is equal to eight parts of the moist. The undigested portions are also dried, and then, by a very simple calculation, the amount of albumin actually dissolved is easily found.

Now, since Mr. Scheffer had so clearly shown that alcohol destroys the digestive property of pepsin, it was of course to be inferred that he did not *precipitate* pepsin with alcohol; but his extraordinary and peculiar candor was yet in perfect harmony with his most unusual degree of scientific accuracy, which must have been, in all probability, on a score with the primitive fiat, "let there be light," and, consequently, there *was a precipitate.* The wishy-washy notice that his saccharated pepsin contains chloride of sodium, for the purpose of enhancing its efficiency, is simply a mean, dishonorable blinder to cover his tracks out of the salt brine. However, above all else the unqualified method of *precipitating* that pepsin (which latter he so particularly describes), did not fail to create grave doubts respecting the legitimacy of the literary effort, and enlightened pharmacists had another palpable exhibition how the ranks of impostors and charlatans were recruited by one more struggling aspirant. The case carried the unmistakable taint apprehensive of another Stearns' embroglio.

Mr. Scheffer's essay No. 3, in the February number of the *American Journal of Pharmacy* of 1872, contained, apparently, a revelation. He says: "When publishing my paper on saccharated pepsin (*American Journal of Pharmacy*, January, 1871), my intention was to continue the experiments then only hinted at, and to publish the results." He continues by saying: "Following up the hint received by certain tests, with a number of experiments, I succeeded at last in obtaining a very satisfactory product." This "very satisfactory product," he stated, was obtained by adding to an acidulated aqueous extract of the mucous membrane of hog's stomach a saturated solution of sodium chloride, collecting the precipitate, which, he says, is pepsin, and further treating it as already explained. He proceeds to assert, "with twenty grains of saccharated pepsin in two fluid ounces of acidulated water, I dissolved 240 grains of coagulated albumin; the precipitate obtained from this solution by chloride of sodium weighed, when dry, twelve grains, of which one grain dissolved 100 grains of coagulated albumin; from this last solution, again, by chloride of sodium, ten grains of precipitate were obtained, of which one grain dissolved between twenty and thirty grains of coagulated albumin. In this way the twenty grains of saccharated pepsin, for which I only claim the power to dissolve 240 grains of coagulated albumin in six hours, dissolved at the rate of between 4,000 and 5,000 grains." Mr. Scheffer also prepares a purified pepsin, of which one grain, when properly treated, can dissolve 500 grains of coagulated albumin. This is a remarkable fact, not easily comprehended. Why one grain of the purified pepsin should be able to dissolve more than four times as much albumin as an equal weight of the same substance contained in the saccharated pepsin can, is an absurdity which Scheffer is only capable of perpetrating, and which requires a low degree of self-respect, or a total want of faith in the intelligence of the rest of mankind. But the most important discovery, after all, is the unprecedented digestive power of syntonin, which Scheffer, with the usual lack of thorough information on his subject, erroneously supposes to be pepton. The first twelve grains of dry syntonin will, of course, contain the two grains of pepsin, which the twenty grains saccharated represented. One grain of this mixture, or in other words, the one-sixth grain of pepsin contained in it, again dissolved one hundred grains of coagulated albumin; that is, one grain of pepsin, after its second precipitation, could dissolve 600 grains of coagulated albumin. From these one hundred grains of dissolved albumin, ten grains of syntonin precipitate were again obtained, one grain of which represented now only one-sixtieth of a grain of pepsin; also dissolved about twenty-five grains of albumin; or one grain of pepsin, after its third precipitation, could dissolve 1,500 grains of albumin.

But Mr. Scheffer implies very plainly that he assumes the peptic property of the pepton precipitate to be an inherent quality of the pepton itself—not as a cause of the pepsin which it contains, but an effect imparted to it, in some unaccountable manner, from previous contact with pepsin. If this were true, the digestive power of pepton (syntonin) would be identical with that of pepsin, and Mr. Scheffer could earn the flattering acknowledgment of having rescued and substantially verified Liebig's long-forgotten theory of digestion.

No less remarkable is Scheffer's observation on the extreme limit of peptic force. According to his researches, half a grain of purified pepsin, when repeatedly treated with successive additions of acidulated water and coagulated albumin, is ultimately capable of digesting 1,500 grains of albumin. He terminates at that figure, but is assured that the process continued will accomplish still greater results than the solution of 3,000 grains of albumin by one grain of pepsin. With unspeakable regret, he admits his disappointment, and can not conceive why his purified pepsin, whose power he exaggerated with all his might, should still be only 1-20th as strong as Wasmann's, which was precipitated with alcohol, and accordingly, as shown by Scheffer, should have no digestive power at all!

However, Mr. Scheffer can feel perfectly satisfied with his result. The misunderstanding simply resulted from another evidence of his superficial method of research. He read that it was 60,000 parts of albumin dissolved by one part of pepsin; whereas, Wasmann wrote, "Pepsin dissolved in 60,000 parts of water showed evidences of peptic power"—though not stating the amount of power.

We further find that the extraordinary display of his numerous scientific experiments, all purporting to be properties of pepsin discovered by himself, are, in the main, results taken from old and standard authorities, which he took the liberty to quote, *seriatim*, without credit. His own discoveries, however, occasionally occur, conspicuous for their inconsistency. The barefaced impostor invariably cautions against impositions; so Mr. Scheffer finds it quite natural to accuse the unconvinced and skeptical of "impudence and boldness." But what is more reprehensible than to take the discoveries of others, apply them, claim them as original, and flaunt the lie in the very face of the open-eyed profession!

The writer, in his article on the manufacture of pepsin (*Pharmacist*, March, 1873), did not consider that Mr. Scheffer's real process was yet a secret; and although Mr. Scheffer never gave any precise directions regarding the mode of preparation, as pursued by him, still it was thought that the extreme simplicity of the operation required no further explanatory guides. But a number of operators, desirous of preparing a reliable article for their own dispensing use, believing that further details were necessary, and that Scheffer's motives were straightforward, personally applied to him for the required information; and in answer, Mr. Scheffer saw fit to state that his process is so extremely elaborate, complicated, and difficult for any one but an expert in the matter, that it is far easier, more economical, even necessary, and generally desirable, to have the parties leave the unpleasant labor of manufacturing it to him, who is thoroughly posted on all the practical points, and purchase their supply from his monopoly, he being capable at all times to furnish the commodity in unlimited quantities, if desired. Now, owing to this adverse disposition of Mr. Scheffer, the dissatisfied but "scientifically-inclined practical pharmacists" in various sections of the country, thankful for Mr. Scheffer's *original* hint, began to experiment on the basis of the information already obtained. The writer, led on by the important observation of Bidder and Schmidt relative to the enormous secretion of gastric juice, and its richness in pepsin, found that the yield came fully up to the expectation; and it will be easily comprehended that the publication of this fact was the main object of the writer's paper on the manufacture of pepsin. At the same time, certain advantages in the manipulation were casually touched, the importance of which, as bearing on the final result, can not be over-estimated. Mr. Scheffer would now attempt to fling the onus of impurity upon the product thus obtained, and grounds himself mainly upon the supposition that the writer employed the whole material of the stomach in the process of extraction, probably because it was stated that the stomachs should be well washed, but with care, so as not to waste the mucous membrane, and then cut into shreds. It is true that this would be apt to mislead those who only examine in the superficial manner peculiar to Mr. Scheffer. It happens, however, that the writer procures the already cleaned and exsected membranes from the professional gut cleaners, who dissect them off the well-cleaned hog's stomach with remarkable skill and rapidity. In handling them, it has become habitual to designate so many membranes as so many stomachs, by a merely conventional expression; and that is why the writer did not use the more specific term "membranes" on the occasion alluded to. However, even under those circumstances, Mr. Scheffer's objection falls helplessly to the ground; because it was found that the yield of pepsin, when the membrane was not detached from the vascular coat, was greatly less than by employing mucous membrane only, and the reason is very apparent. According to Von Wittich and others, albuminous matters absorb pepsin energetically from its solution, whilst its affinity for gelatigenous tissues is far weaker. Now, the instant that pepsin diffused into the acid liquid, the albuminous exterior portion of the stomach re-absorbed a part of it again, which therefore was, in a great measure, lost. Moreover, the low temperature at which the extraction is conducted precludes digestive action entirely; consequently, the liquid could not even contain syntonin, much less pepton. However, if the process of digestion was permitted upon the material, the farther it had progressed, the least the pepsin would be contaminated by the products of digestion (syntonin), since pepton would remain perfectly dissolved in acid brine.

By employing mucous membrane, even, well freed from adhering mucus, with only a moderate amount of acidulated water—as Mr. Scheffer would let us presume he does—the pepsin also diffuses very sparingly, the greater portion remaining in the glands and ducts, unless an abundance of albuminous matter be present to exert an eductive affinity to draw it forth, as will occur during the course of natural digestion. And further, if such a liquid, containing but very limited quantities of pepsin, is mixed only with a *solution* of salt, the pepsin yield is so trifling that it does not repay extraction, even at Mr. Scheffer's exorbitant prices.

The first several trials, made evidently according to the spirit of Mr. Scheffer's *hints*, resulted invariably in this negative manner. The first important modification consisted in the application of a comparatively *large* volume of acidulated water. Into this, at a low temperature, the pepsin diffused rapidly and abundantly. It was also found that constant agitation was a potent factor in the process of maceration. A few hours of continual stirring will accomplish as much as several days of maceration with relatively little stirring. Then again, a saturated solution, merely, of the salt added to this dilute liquid, is not sufficient; the chloride must be added until the liquid is saturated with it.

The writer finds that adhering fatty matter, if allowed to contaminate the pepsin, has a tendency to impart, after drying, a peculiar rancid, not putrid, odor. The dilute liquid is therefore always strained through some suitable strainer before adding the salt. The impurities of the salt, which Mr. Scheffer dreads so much—but what they are is really difficult to make out—are easily obviated. The writer collects the precipitated pepsin upon a filter, through which the liquid passes very rapidly; after draining, the adhering liquid is, in a great measure, removed by pressure, and the residue redissolved in acidulated water. The rather concentrated solution is strained through linen or muslin, and the pepsin is, from this, reprecipitated by means of a filtered saturated solution of common salt, the pepsin again collected on a filter, drained, and spread out on abundant folds of bibulous paper to dry. When most of the liquid has been absorbed by the paper, a weighed quantity of lactin is added, the mixture fully dried by exposure in the open air, and subsequently diluted with the required amount of lactin, to bring it to the standard of strength adopted by Scheffer.

It is, however, the writer's opinion that the re-precipitation is superfluous refinement. The writer finds that there is no appreciable difference in the pepsin, either in strength or physical appearance, as obtained from the successive macerations.

It is also found that pressing the moist pepsin does not yield a powder of such uniform fineness and solubility as when dried by absorbing the liquid with paper.

The writer believes, although he has not made the trial, that for purposes of solution, a pepsin in the condition of an extractive consistency, similar to the meat extracts, would be greatly superior to the saccharated powder. By removing most of the brine from the precipitate, through judicious washing and pressure, and the subsequent addition of glycerin to a definite standard of strength, a desirable and permanent product could undoubtedly be obtained.

The writer now claims that the pepsin prepared by the above modification of Scheffer's *hint* is freer from albuminoids than the article prepared by Scheffer, although he (Scheffer) asserts, rather too hastily, as usual, that the whole mucous membrane, when dry, weighs no more than the product of pepsin, obtained by the writer from it. The writer admits, and the digestive power of the dried membrane proves it (this being more than ten times stronger than Scheffer's saccharated pepsin), that aside from a trace of inorganic salts, water, and pepsin, the glandular layer is membranous envelope; but the thin sheet of this envelope weighs, when extracted, very little, and, moreover, it is composed of such peculiar material, classified under the head of elastic membranes, which are very little, if at all, affected by acidulated pepsin.

The pepsin prepared by the writer, when heated with strong nitric acid, dissolves almost perfectly to a nearly colorless liquid, which shows the absence of xantho-proteïc reaction.

Scheffer's saccharated, as well as his purified, pepsin, in shreds, when similarly treated, gave a yellow insoluble precipitate, together with a yellow solution.

The pepsin possessed the full digestive power that Mr. Scheffer ascribes to his own preparation; and, moreover, as to real intrinsic power, the writer's pepsin exceeds Mr. Scheffer's, considerably, because it converts albumin more thoroughly into pepton, while Scheffer's pepsin lingers longer with the first effect, and leaves more syntonin unconverted, as shown by precipitation with sodium chloride when added to saturation to the digested liquids. A much greater yield of syntonin is obtained from the albumin digested by Scheffer's pepsin than by that of the writer's modified process.

The syntonin precipitate is white, compact, and subsides rapidly. When treated with strong nitric acid, it gives the characteristic xantho-proteïc reaction. When treated with Millon's solution (prepared by adding one part of strong nitric acid to one part of mercury, and diluting the solution with four and a-half parts of water), it gives the very characteristic red precipitate of the proteïds.

When syntonin is subjected to the alkaline cupric oxide test of C. G. Mitscherlich, improved by Piotrowsky, the intense violet-red solution is obtained. (This test is best executed by adding a small quantity of each neutral potassium tartrate and potassium hydrate to the albuminous mixture, sprinkling in a trace of cupric sulphate in crystals, and warming gently.)

The acidulated solution, resulting from the digestion of albumin, gave a most abundant, curdy, dense, white precipitate, with tannic acid, which rapidly subsided, but seemed to dissolve, to a great extent, on dilution with water.

The same acidulated solution gave an abundant precipitate with an iodized solution of potassium iodide, which, on dilution, disappeared to some extent. Gave no precipitate, with alcohol, in any proportion, but when the alcoholic liquid was treated with ammonia, an abundant white precipitate was formed. Gave a very faint precipitate, with mercuric chloride. Gave no precipitate, with an acidulated solution of plumbic acetate.

The pepsin obtained from the successive macerations was chemically identical, as its digestive power and behaviour with reagents showed.

When either the dry saccharated or freshly precipitated moist pepsin was heated with a concentrated solution of potassium hydrate, no ammonia, perceptible by its odor, was evolved, although white fumes were produced in the proximity of acetic acid.

In this particular, Scheffer's saccharated and also his purified pepsin showed a similar effect.

The pepsin, moist or saccharated even in large quantities, gave only a very faint pink coloration, with the cupric oxide test; but the addition of merely a trace of syntonin gave a decided reaction at once.

Scheffer's saccharated pepsin gave a much deeper coloration; but when slightly heated, cuprous oxide was precipitated.

The saccharated pepsin, as well as the moist, recently precipitated, even in large quantities, gave only a faint pinkish reaction with Millon's solution; but the addition of a mere trace of the syntonin precipitate, gave a decided reaction at once.

Scheffer's saccharated pepsin, as well as his purified, gave Millon's reaction, with surprising power.

It is proper to notice here that, since the combined effect of nitrous acid and mercurous nitrate determines the purple-colored precipitate, a large amount of soluble chloride will either obscure or prevent the reaction; firstly, by the precipitated mercurous chloride; secondly, the decomposition of the mercurous nitrate, and thirdly, the accumulation of nitric acid, which destroys the reaction; also, if the addition of the solution must be much increased to supply the decomposition of the necessary mercurous nitrate.

Freshly-precipitated pepsin, without sugar, when treated with strong sulphuric acid, formed at first a colorless doughy mass, which, on severe heating, became charred.

The saccharated pepsin remained colorless, some time, in mere contact with the strong acid, and on heating became brown, but slowly. The addition of saccharose to the colorless acid mixture produced a dark brownish-red color at once.

Scheffer's saccharated pepsin gave the dark coloration immediately, without heating.

The acidulated aqueous solution of freshly-precipitated pepsin gave only a very faint precipitate, with a large excess of mercuric chloride.

Gave a very perceptible precipitate, when dropped into a strong solution of iodized potassium iodide.

Gave no precipitate, with an acetic acidulated solution of plumbic acetate; but when the acid mixture was very cautiously treated with solution of diplumbic acetate, a very marked flocculent precipitate appeared.

Gave a most abundant gelatinous precipitate, with tannin.

Gave a bulky flocculent precipitate of pepsin, when treated with once or twice its volume of alcohol, which gave the identical reactions as when first precipitated by sodium chloride. The alcoholic filtrate gave no reaction with the usual reagents. Ammonia only produced a faint opalescence, and, finally, a faint precipitate.

If, however, the precipitated pepsin is left in contact with the alcohol, in the course of a number of days it will again completely dissolve in the liquid from which it at first precipitated. The solution again gives the characteristic bulky precipitate, with tannin; but when the solution is diluted with acidulated water, and treated with coagulated albumin, no digestion takes place, showing that although the pepsin was perfectly dissolved by the alcohol, it had totally lost its digestive power on albumin. It was also either not absorbed by the albumin, or if so, it did not show any action when the liquid containing alcohol was decanted, and replaced by a simply aqueous acidulated one.

From these reactions, the writer concludes that the pepsin precipitated by sodium chloride, even after reprecipitation with alcohol, is not by any means pure pepsin. According to Brücke, pure pepsin is not precipitated by tannin, whilst in the case of pepsin obtained by sodium chloride, tannin is the most characteristic reagent; consequently, it still contains an unknown admixture which determines this peculiar reaction. This precipitation with tannin is alone sufficient to establish that fact; but the other proteïc reactions which it also evinces with great distinctness, put it beyond question.

Von Wittich accepts the theory of Schmidt on the digestive action of pepsin; but it does seem that, since the process consists in combining pepton, a derivative of albumin, with chlorhydric acid as a necessity to its assimilation, and as the acid pepton can only be obtained by prolonged heating of albumin with chlorhydric acid, or more rapidly at a lower temperature by the intervention of pepsin, that pepsin combines not actually with chlorhydric acid, but simply supplies the purpose of a bridge or entrance, over which or through which, the chlorhydric acid passes into chemical union with pepton. This, according to the writer's idea, does not necessarily imply previous combination of chlorhydric acid with pepsin; pepsin only induces the chlorhydric acid to seize the pepton of the albumin, as this splits under the inductive exertion of the power of pepsin. The decomposition seems as mysterious and imperceptible on the atomic arrangement as that effected by the galvanic current.

In the manner of assaying pepsin, decided improvement is much needed. The writer believes that the methods based upon the use of the saccharometer are open to too many objections; the polarizing apparatus can not at present supersede the ordinary method of weighing the undissolved residue after the action has endured a certain specified time; but the weight of the moist residue is subject to the most fallacious indications, being so constituted that a good pepsin may be underrated, and a spurious one receive credit for activity which it does not possess.

Mr. Hawley's proposition, to weigh only the dried residue, is a good one. The writer employs a modification of the old method with Hawley's improvement, and the use of alcohol, to secure the perfect separation of the digested products still tenaciously adhering to the unaltered albumin; together with a double assay with unequal quantities of albumin, and averaging the result. The writer assumes, as the standard of strength of any pepsin, that ten grains of it in two fluid ounces of water, acidulated with one fluid drachm of officinal diluted chlorhydric acid, should be represented by a quantity of coagulated albumin which is the average between what the digestive fluid dissolved out of 120 grains of coagulated albumin in one experiment, and 240 grains in the other. A portion of the albumin to be used is weighed, crushed, treated with acidulated water, washed with alcohol, collected on a tarred filter, dried perfectly, and again weighed. The ratio between the first and last weights is used as the co-efficient to bring the weight of the dried undigested portions up to the standard of the original moist albumin. The time is limited to six hours at a temperature between 100° and 105° F. The albumin is employed either in shreds or small cubes; the residue is first rinsed several times with water, and then digested for a short time with alcohol; the liquid decanted, and the insoluble portion collected on a tarred filter, dried either in the open air or over a water-bath, weighed, the result multiplied in each case by the ratio already found, the products added, and the sum divided by 2. The quotient is taken as the normal power of the pepsin examined.

The writer has invariably found that pepsin, even Mr. Scheffer's, does not dissolve the amount of albumin it is warranted for, during the time limited to its action. But when a much greater amount of albumin is employed than it is supposed to dissolve, then the quantity digested often considerably exceeds the limit of its assumed effect. It is, therefore, improper to say that any particular pepsin can completely digest all of a specified amount of albumin in a certain length of time.

The action of artificial pepsin as a medicinal agent may be represented by zero. It has no therapeutical properties, and would merely supply a substitute for a deficiency in the normal power of the natural pepsin in the stomach. If dyspepsia originates from want of action in the secretory apparatus which, in its normal condition, supplies the pepsin required for the digestive process, then it is plain that pepsin can not cure dyspepsia, if due to some organic derangement of the secretory function, because pepsin can not correct the abnormal condition of an organ which produces that body itself, and owes its generative action to a vital impulse. If dyspepsia is caused by too great an accumulation of acid in the stomach, which prevents the proper action of pepsin, then of course additional pepsin will be useless. If indigestion is caused by an absence of the necessary acidity, then the pepsin pre-existing in the stomach also can not act, and, consequently, additional pepsin is again useless. But in view of the fact that the large quantity of normally-produced pepsin is even not sufficient to meet the total digestive demand, therefore a single insignificant grain of doubtful pepsin can certainly have no effect; and when a profession accepts such agents as acknowledged remedies, it only furnishes a deplorable exhibition of fallacy in therapeutics, and of deficiency of common sense in selecting proper remedies.

RESEARCHES ON FERRIC IODIDE.

BY GEORGE F. DECKMAN.

It has long been a question in the writer's mind whether ferric iodide is in fact a tangible entity. The separate existence of such a compound has never been established with an absolute certainty. A reaction indicating the presence of ferric salt, when a combination represented by the empirical formula Fe_2I_6, is sundered, does not yet prove a molecular union in the restricted chemical sense. The product derived from this combination of circumstances may, possibly, be the result of a transitory effect, whose ultimate phase had eliminated the iron in this final ferric condition; and, therefore, in lieu of the simple expression,

$$Fe_2I_6+6(KOH)=6KI+Fe'''_2\,6(OH),$$

we may assume,

$$3(Fe_2I_6)+18(KOH)=6(Fe'2(OH).)+(KIO_3)+17KI+3OH_2$$
$$6(Fe''2(OH)+KIO_3+3OH_2=3(Fe'''_2\,6(OH).)+KI.$$

We are well acquainted with the fact that, when ferric hydrate is dissolved in hydric chloride or bromide, the product does not conform to the supposed formula Fe_2Cl_6 or Fe_2Br_6; but a much greater quantity of the hydrate is always absorbed than would correspond with this composition. The case is, in most respects, similar when hydric iodide is employed; but since the molecular affinity of iodine is much weaker in many of its combinations than bromine or chlorine, consequently the iodine product will exhibit some distinctively marked peculiarities of its own. The precipitation of ferric hydrate in the presence of caustic alkali is, however, not the only instance by which ferric atomicity is apparently indicated. Similar evidences are educed by means of other reagents, especially such inducing a double decomposition, unattended by the phenomenon of precipitation; for if ferric chloride is mixed with potassium iodide, a dissolution seems to take place, as shown in the equation.

$$Fe_2Cl_6+6KI=6KCl+Fe_2I_6.$$

But the solution, although giving the ferric reactions, has a decided odor of iodine; and, in view of this latter fact, the result could also be written

$$Fe_2Cl_6+2KI=2FeCl_2+2KCl+2I.$$

or,

$$Fe_2Cl_6+6KI=6KCl+2FeI_2+2I.$$

a reaction upon which a volumetric determination of iodine is based; but then the change is effected according to the first of these two equations.

The liquid is boiled in a retort until the iodine has completely passed into the receiver, containing a solution of potassium iodide; and the iodine is then determined by means of a titrated solution of sodium hyposulphite.

We are made aware, by this, that heat expels part of the iodine from a solution, containing it in the proportion to form a higher iodide than the ferrous salt, and that the residual iron salt exists in the ferrous state. But this is no evidence whatever disproving the possibility of ferric iodide; because many perchlorides and perbromides, when heated, are reduced to a lower basic equivalency, accompanied by the separation of free chlorine or bromine. However, these higher chlorides and bromides of iron and other bases can, in a great number of instances, be readily exhibited and separately examined in that peculiar form, since the constituent elements are in actual atomic combination, and therefore not so easily disturbed by ordinary causes.

With the supposed iodine compound, the aspect of affairs is altogether different. If, for example, ferrous iodide is treated with additional iodine, or if potassium iodide is mixed with ferric chloride, the results will be identical. Caustic alkalis, added to either solution, precipitate only ferric hydrate free from ferrous hydrate, monoxide, or tri-ferro-tetroxide. But if either solution is shaken with chloroform, the surplus iodine is instantly gathered up, and completely carried out of the aqueous solution, by means of the chloroform. The chloroformic solution, after evaporation of the chloroform, and volatilization of the iodine, leaves no residue, showing that no iron but only iodine was dissolved. The aqueous solution then contains all of the original iron, and that in the condition of ferrous salt, as indicated when subjected to examination. This fact would tend to prove that the iron, even in presence of excess of iodine, were only in the ferrous form. Now, if potassium iodide be treated with ferric chloride in aqueous solution, and, to the deep brownish-red resulting liquid, potassium nitrate is added, an indistinct yellowish turbidity is formed, accompanied by a still further deepening of color in the solution; but if ammonia is added, a greenish-white or either black precipitate will fall instead of a yellowish one, as before the addition of nitrate. But if to the turbid solution containing the nitrate a considerable amount of sodium sulphate is added, a copious crystalline precipitate of iodine is rapidly produced, whilst the liquid loses its deep color, becomes clear, and shows the ferrous reactions. If to the mixture of potassium iodide and ferric chloride, sulphate of quinine is added, a precipitate of Herapath's iodo-quinic sulphate is thrown down, whilst the supernatant liquid gives the reactions of iron monoxide. The quinic compound is not easily decomposed, even by boiling with aqueous potash; but in alcoholic potash, decolorization, even without heat, is almost instant. The alcoholic solution, on dilution with water, precipitates the alkaloid, whilst the iodine remains combined in the solution.

The red precipitate of iodo-quinic sulphate is also easily decomposed, in an alcoholic solution, by means of metallic iron or zinc, on dilution with water, and the addition of citric acid, followed by caustic alkali, the alkaloid is again precipitated.

This reaction would also aid to confirm the presence of ferrous salt in contact with excess of iodine.

This is also evident in every case where an ordinary salt of a strong acid is added to the iodized iron solution, as chlorides, nitrates, sulphates, etc., because no change is apparently induced other than, at most, a precipitation of iodine insoluble in the strong saline solution, simply owing to the fact that, in such a mixture, the elements already have their choice, and the combination is compatible, for the following reaction would not be chemically true:

$$Fe_2I_6 + 3(K_2SO_4) = Fe'''_2(SO_4)_3 + 6KI.$$

Yet, if a salt of a weaker acid—most exquisitely illustrated by an acetate—is added to the iodinized solution, a decomposition immediately takes place, resulting in the total restoration of chemical equilibrium. The solution does not change color, but the iodine odor and taste instantly vanish, and the liquid only betrays the ferruginous flavor of ferric acetate, with a tinge of saline. The solution gives the ferric reactions, and chloroform takes up no iodine, showing that this is in actual combination. The result is lucidly expressed in the following equation:

$$Fe_2I_6 + 6(C_2H_3KO_2) = 2(Fe'''(C_2H_3O_2)_3) + 6KI.$$

The equation is interpreted by assuming that Fe_2I_6 is a definite combination similar to Fe_2Cl_6, in which HI similar to HCl has a much stronger affinity for KOH than the organic molecule $C_2H_4O_2$. Hence it is plainly apparent that the result must be potassium iodide and ferric acetate, which is really the case.

Other salts, of weaker acid radicals, act in an analogous manner; for if we add an alkaline citrate to this iodized solution, we have an absolutely identical change, for the result can only be ferric citrate and potassium iodide, thus: Taking the normal citrate of potassium, and we have

$$Fe_2I_6 + 2(C_6H_5K_3O_7) = 6KI + 2(Fe'''(C_6H_5O_7).)$$

The color of the solution obtained in this case is not the usual brownish-red of the officinal ferric citrate, but a light green, which is invariably the color of the ferric citrate, resulting from double decompositions. A liquid containing ferric citrate, having precisely the same light greenish color, is also obtained when ferric sulphate or chloride is mixed with a normal citrate of potassium, sodium, or ammonium. The organic acid radical always absorbs the ferric molecule, while the monad base passes into combination with the stronger acid radical. Thus:

$$Fe'''_2(SO_4)_3 + 2(C_6H_5K_3O_7) = 3(K_2SO_4) + 2(Fe'''(C_6H_5O_7).)$$

$$Fe_2Cl_6 + 2(C_6H_5K_3O_7) = 6KCl + 2(Fe'''(C_6H_5O_7).)$$

The brown solution of ordinary ferric citrate contains, besides the normal ferric citrate, a much more basic salt, upon which the brown color depends; for if the green solution obtained by double decomposition between a normal alkaline citrate and a ferric salt be treated with freshly-precipitated ferric hydrate, a large quantity of this is dissolved, and the solution becomes brown. This is also a parallel action to the stronger acid radicals, which likewise absorb a superabundance of hydrate, as already stated above.

From these results, the inference is drawn that ferric iodide does not exist either separately or in combination. But the writer concludes that, as iodine holds the outermost limit of the fan-like radiation of the chlorine group, emanating from chlorine (or fluorine) as the initial point, consequently there will be more or less divergence in its particular relations to other bodies, compared with the general properties of the chlorine group; and therefore it is assumed that, in certain connections, it evinces neither positive or negative effects from internal disposition, but relinquishes the indefinable attitude in favor of the strongest affinity presented to it.

COLLATED PRACTICAL RECEIPTS.

Dr. Squibb's Compound Tincture of Opium, or Diarrhœa Mixture.—

Take of Tincture of Opium depurated,
Spirit of Camphor,
Tincture of Capsicum; of each, f℥j.
Chloroform purified, fʒiij.
Alcohol, 95 per cent. sufficient quantity to measure f℥v.

Each fluid drachm, or teaspoonful, contains about 100 drops, consisting of 12 minims of each of the first three ingredients, and 4½ minims, or 18 drops of chloroform.

Dose.—For persons over 18 years of age, a teaspoonful; for persons 14 to 18 years of age, a small teaspoonful; for persons 10 to 14 years of age, half a teaspoonful; for persons 6 to 10 years of age, 30 drops; for persons 2 to 6 years of age, 10 to 30 drops: for infants, 1 to 10 drops, according to age. To be taken in water.

In time of epidemic cholera or diarrhœa, when any person has two movements of the bowels more than natural within 24 hours, the second one should be followed by a dose of this mixture; the dose to be repeated after every movement that follows. If the movements increase in frequency, or in copiousness, after the second dose of the medicine has been taken, a physician should be sent for at once, and a double dose be taken after each movement, until he arrives. Immediately after taking the first dose, the person should go to bed, and remain there for 12 hours after the diarrhœa has entirely ceased.

Made a little more dilute to adapt it better to extended popular use, it was largely applied in the last epidemic of cholera by the Metropolitan Board of Health of New York, and by the Boards of Health of some other cities, and appears to have accomplished all that could be reasonably expected from any arbitrary formula. It is given here in case cholera should again become epidemic, and as a useful preparation for summer diarrhœas.

Hamlin's Cholera Mixture.—

No. 1. Take of Tincture of Opium,
Tincture of Camphor; of each, 1 part.
Tincture of Rhubarb, 2 parts.
Mix.

No. 2. Take of Tincture of Opium,
Tincture of Capsicum,
Tincture of Cardamom Co.,
Ginger; of each, equal parts.
Mix.

Rushenberger's Cholera Mixture.

Take of Tincture of Ginger,
Tincture of Capsicum,
Tincture of Peppermint,
Tincture of Opium; of each, equal parts.

Chlorodyne.—

Take of Sulphate of Morphia, grs. 80.
Hydrocyanic Aciddil.
Glycerin,
Caramel; of each, f℥ ss.
Extr. Indian Hemp, ℈ij.
Oil of Peppermint, ʒ ss.
Oleo-Resin of Capsicum, gtt. xv.
Chloroform pur., f℥ vj.
Alcohol, f℥ j.
Mix.

EDITORIAL.

THE presentation of the Attfield testimonial to the College, at its last meeting, was a very happy incident, and called forth a strong spontaneous expression of the feeling, common to every member, of admiration and appreciation of Dr. Attfield's disinterested kindness in the work of love he so successfully planned and executed for our benefit. His features and expression so happily given us in the portrait, will henceforth be familiar to each of us, as the face of one whose name has already become to us as a household word, and cherished as one near and dear.

PHARMACAL MEETINGS.

Chicago College of Pharmacy.—Adjourned regular meeting of the College held June 11th, 1873. President Whitfield called the meeting to order, and after reading of the minutes of the last meeting by the Secretary, the Committee on Diploma reported that they had been unable to finish the work, and, on motion, they were requested to report to the Board of Trustees at its next meeting. The question of engraving and reissuing the fire-destroyed certificate of membership was, on motion, referred to the Board of Trustees with power to act.

The Committee on Finance, failing to make a report, on motion, an investigating committee, consisting of the Secretary, Treasurer, and ex-Treasurer, were appointed to examine the accounts.

The following were appointed delegates to the Richmond meeting of the American Pharmaceutical Association, and to the convention of teaching colleges, with power to fill vacancies: Thomas N. Jamieson, Albert E. Ebert, George Buck, E. H. Sargent, and Theo. H. Patterson.

A motion prevailed empowering the Board of Trustees to co-operate with any movement that may be made for holding a convention of pharmacists of the Northwest during the October Exposition in this city.

The committee on the revision of the by-laws reported the following changes, which, being separately acted upon, were adopted. The initiation fee and annual dues were each raised from $5 to $10. Life membership to $100. Associate membership to $5 annually, or $50 if paid in one payment. After making other minor changes in the wording of the by-laws the business committee moved that a complete list of all the donations received by the college since the fire be published in the PHARMACIST as soon as an inventory of the same is made.

Mr. E. H. Sargent, in behalf of the committee on the Attfield testimonial, presented to the college an oil painting representing Prof. J. Attfield, of London, with the following remarks:

MR. PRESIDENT: In behalf of several of our fellow-members, I have the honor and pleasure to present, in their name, to the Chicago College of Pharmacy, this work of art, as a fitting memorial of events ever to be remembered—the destruction and re-establishment of this school of pharmacy. And not alone, sir, nor chiefly, does this work of art remind us of events in our own narrow sphere, for the inspiration which gave rise to it had its birth beyond the seas.

In this picture we present to you, sir, and to our associates, a faithful portrait of one who has for all time endeared himself to each one of us as the benefactor of this college, the Hon. Prof. Attfield, who stands to us as the representative of that noble band of English Pharmacists who so generously and so promptly came to our aid, in the time of our great adversity. I cannot, sir, with any words at my command, adequately express the admiration excited by the prompt and effective generosity of our English friends. We owe to their endeavors the present condition and means of usefulness of this college; may we not be sure that so important a result will, in view of the good to be accomplished, compensate in a great measure, the generous givers, and prove, more than any words which we may utter, the value and our appreciation of their gift. May we and our successors be ever reminded by this portrait that we have a duty to fulfil: that in receiving we pledge ourselves to bestow, not alone in kind, but in all ways that will aid the unfortunate, nourish the needy, or educate the ignorant. Thus only can we prove ourselves worthy of the confidence and generosity bestowed, or properly use the trust confided to us.

In conclusion, let us hope that our benefactor and his co-laborers may each receive the reward of the generous giver, and long live to witness the growth of their grateful recipient.

In placing this truthful portrait of our valued friend upon these walls, let us, with one voice, echo the motto with which we are greeted, "*Concordia soll ihr name sein*," and add ESTO PERPETUA.

The President, Mr. THOS. WHITFIELD, on behalf of the College, accepted the testimonial, responding as follows:

SIR: As the presiding officer of this College, I have the honor to accept in its behalf the very life-like and handsome offering, which you have so appropriately presented.

In accepting this portrait for the College, I should be doing injustice to those whom I have the honor to represent, and also to my own feelings, were I to pass over in silence the generous action of those who, prompted by the generosity of our transatlantic friends, caused the production of this, to us, touchingly eloquent memorial.

The College, I am sure, desires to return its grateful thanks to those of its number who were insrrumental in honoring it with this portrait of one who must ever occupy a large place in the heart of its every member. Wider spread, better planned or executed, and less ostentatiously displayed benevolence was never known than is represented in these halls, expressing at once the sympathy of our English friends at our calamity, and their appreciation of our efforts in the education of our profession, in a form so tangible that every beholder must be at once struck with admiration. Now we are called upon to accept this the fitting finale, the very counterpart of the originator of this outpouring from our fellow-workers in pharmacy in Great Britain.

I believe that this College as a body is alive to the importance of the trust reposed in it, and knowing this I feel fully warranted in assuring you, sir, and through you our English as well as our home friends, that it will not prove recreant to the important trust or incompetent to the discharge of its duty.

We are told that a pebble cast into a body of water causes a displacement co-equal with the water's surface, only limited by its banks. Also, that the vibration communicated to the atmosphere does not die, but "keeps circling on through infinite space forever."

Now, sir, if these statements are true in relation to causes so minute, who shall dare attempt to measure the influence which this munificent donation—the instigator of which we recognize in this portrait—shall exert on the education of the pharmacists of the present not only, but of the future, throughout endless generations.

On motion it was voted that the portrait of Prof. Attfield be placed on exhibition in the Art Gallery of this city, bearing a suitable inscription.

On motion to adjourn, adjourned. THEO. H. PATTERSON, *Secy.*

BOOKS AND PAMPHLETS RECEIVED.

A General Index to the American Journal of Pharmacy, from its commencement, December, 1825, to November, 1870, inclusive. Compiled by HANS M. WILDER, and published by the Philadelphia

College of Pharmacy. 1 Vol. 8 vo., pp. 314, double column. Paper, price $3; Cloth, price $3.50.

For this boon, the want of which has been so long felt by investigators and writers on pharmacy in this country, we are indebted to the ardor and perseverance of the compiler, Hans M. Wilder, who, after several years devotion of his leisure time to this work, without compensation, has produced an index which, for completeness, systematic arrangement and accuracy, is worthy of all praise. It is not a mere transcript of the index from 1825 to 1870, but it has been entirely re-written, with a new and complete classification of the subjects treated. The index of authors is also a feature that is of the greatest value, as it frequently is the case that the name of the writer is remembered, while the subject or the title of the same cannot be recalled at the time of reference.

To those who are readers of this valuable journal, and have a partial set, or are so very fortunate as to possess a complete series, or have access to one, will find this General Index a great convenience, and will save much time which would otherwise be lost in searching through one volume after another for information, the date of which is forgotten. The library of the Chicago College of Pharmacy, previous to the fire, had a complete set. This great loss has to some extent been replaced by the generosity of the Philadelphia College of Pharmacy, who have presented this college with as complete a set as was in their power, several of the volumes of the first and second series being out of print. We hope that our college may yet be so fortunate as to obtain the missing volumes. This publication dates back when pharmacy was yet in its infancy, and affords a connected history of its progress, it being the oldest journal devoted to Pharmacy in the English language, and in its early days received articles for publication from our English colleagues across the water, until the year 1841, when Jacob Bell established the *Pharmacuetical Journal of London.*

The index is prefaced by a historical notice of the *Journal* and its progress, by the publishing committee, and we learn that in consequence of the comparative small number of subscribers to this index, about one-tenth of the total cost has been secured to its publishers. Now we urge each and every one of our readers, and more especially the members of the Chicago College of Pharmacy, to supply themselves with a copy of this index. It can be obtained by addressing Mr. H. H. Wolle, business editor of the *American Journal of Pharmacy*, 145 North Tenth street, Philadelphia, or through the editor of THE PHARMACIST, 584 State street, Chicago.

A Memorial of Prof. Edward Parish, read at the annual meeting of the Philadelphia College of Pharmacy, March 31, 1873. By William Proctor, Jr., on behalf of the committee on deceased members.

The roll of membership of the College, and other items, were crowded out for want of space, and will appear in our next issue.

—EDITOR.

THE PHARMACIST.

VOL. VI. CHICAGO, AUGUST, 1873. No. 8.

ON THE TASTELESS IRON COMBINATIONS.

BY J. CREUSE, OF BROOKLYN, N. Y.

In your last number you published a correspondent's paper on Ferric Iodide, which contains some rather debatable theories, and certain statements that must not be allowed to pass uncorrected.

I shall deal with facts, to begin with, because they are more important. Theories will come afterwards, for they are of secondary consequence. Many are proposed and accepted to-day only to be set aside to-morrow, while it is of the greatest consequence that facts should be known and stated correctly.

Your correspondent explains the formation of the tasteless iodide of iron in the following manner:

$$Fe_2I_6 + 2(C_6H_5K_3O_7) = 6KI + 2(Fe'''(C_6H_5O_7).)$$

Sesqui-Iodide of Iron. + Citrate of Potassium. = Iodide of Potassium. + Citrate of Iron.

This equation is simple and elegant, but it contains two errors of fact. The first term implies that 4 equivalents of ferric iodide can be transformed into the tasteless combination by the addition of 2 equivalents of citrate of potassium, while, in fact, 4 equivalents of that salt are necessary to the purpose.

In other words, using plain weights instead of symbols, in order to avoid the inextricable confusion entailed by the simultaneous use of both the old symbols and the new French notation, the first term of that equation means that 768 grains of iodine in the shape of sesquiiodide of iron will give a green, tasteless solution on the addition of 420 grains of the citric acid $C_6H_{10}O_8$, saturated with potassa. This is not correct. The change is only effected by twice that quantity of citrate of potassium, and not a grain less. Hence the first term of your correspondent's equation should read:

$Fe_2I_6 + 4(C_6H_5K_3O_7)$.

It follows, of course, that the second term of the equation is incorrect, and does not represent at all the composition of the tasteless iodide of iron. More than that, the mixture $6KI + 2[Fe(C_6H_5O_7).]$ as a compound is an impossibility. For if iodide of potassium be added to the officinal citrate of iron, in no matter what proportions, iodine, after a short contact, is set free. This reaction, I am aware, is not mentioned in any books, but it happens, nevertheless, just as I state.

The two immediately following equations, by which your correspondent explains the formation of the tasteless muriate and sulphate of iron are incorrect, for similar reasons. To conform to facts, their first terms should be:

$Fe_2(SO_4)_3 + 4(C_6H_5K_3O_7)$.
$Fe_2Cl_6 + 4(C_6H_5K_3O_7)$.

The reaction, mentioned, between acetate of potassium and ferric iodide, is too indefinite to admit of discussion. There is no change of color, and no weights are given.

I beg also to dissent from the statement that "the light green color of the tasteless iron compounds is invariably the color of the ferric citrate resulting from double decomposition, while the brown color of the officinal citrate is due to the presence of some more basic salt."

My experience is that a given quantity of citric acid is always saturated by the same proportional amount of ferric oxide, and that they never form any basic salt. If the brown color of the officinal citrate were due to that hypothetical basic citrate, an addition of citric acid would produce the characteristic light green color, a result that every one knows cannot be obtained in that manner.

Now that I have disproved, as I believe, your correspondent's theories, I suppose I may be expected to give and prove mine. This I shall proceed to do. But first, I must remark that these tasteless iron combinations (a name I prefer, because it implies no theory) belong to the same class of compounds as the various soluble ferric phosphates, pyrophosphates, valerianates, hypophosphites, arseniates, etc., already known and described. All these compounds, of which the ordinary medicinal ferric pyrophosphate may be taken as a type, have so many chemical characteristics in common that they cannot be separated, and what is said of one applies to all the others.

Their distinctive reactions are the following: They are all soluble in water; all have a peculiar green color, turning to dark brown on exposure to sunlight. Tannin or ferrocyanide of potassium cause no precipitate, but only a slight coloration in their solutions. Sulpho-carbolate of soda produces no red color. Ammonia darkens them, but forms no precipitate; fixed alkalies deepen their color, and in great excess cause a precipitate. Mineral acids, sulphides and sulphites destroy the combination altogether. I cannot help mentioning that the officinal citrate of iron is colored deep red by sulpho-carbolate of soda, and affords abundant precipitates with both tannin and ferrocyanide of potassium.

As I have stated elsewhere, I think these combinations may be considered as compound salts in which the alkaline citrate plays the part of a base and the ferric salt that of an acidulous radical.

That ferric salts may be considered as acids in some cases, will be readily conceded; for all the soluble sesquisalts of iron, even when chemically saturated, have an acid reaction, and some of the insoluble ferric salts are known to form combinations with alkalies. Ferric phosphate and pyrophosphate, for instance, are soluble in ammonia, even in great excess; and I have remarked that caustic soda or potassa, not in excess, dissolves them as well. Such solutions cannot be anything but combinations, for ferric oxide is not soluble in caustic alkalies.

On the other hand, tribasic alkaline citrates are generally conceded to be neutral,—at least they are so to test papers. Yet, when a solution of neutral citrate of ammonia is allowed to evaporate in open air, the crystals obtained are always a bibasic citrate, showing that this may be, after all, the really saturated citrate of ammonia. The same does not happen with either soda, potassa or lithia, because the bases are not volatile, but the fact remains that the tribasic alkaline citrates may be considered as possessing basic tendencies.

All this, however, is pure theory, to which, as a pharmacist, I wish to attach no more importance than it deserves.

The following points are, I think, of much more consequence; they cannot be easily controverted, and I rely on them to prove the superiority of the new class of compounds over all the iron preparations used formerly:

1. It is known that, in all parts of the human system, iron is always found in the shape of ferric salts; therefore, as was said by Mr. Rother before I said it, the sesquisalts should be preferred to the protosalts, whenever iron is indicated.

2. Sesquisalts of iron are either insoluble in water, or so unpalatable when soluble, as to be almost impossible to take.

3. I have proved that all ferric salts combine readily with almost all the vegetable salts present in human food.

4. These new combinations are neutral, nearly tasteless, do not blacken the teeth, and do not even stain the linen.

5. They represent exactly the natural compounds which form in the stomach whenever iron in any shape is administered before a meal, and they contain the iron in the very state which is best adapted for its immediate absorption into the economy.

PRACTICAL FORMULÆ FOR MINERAL WATERS.

BY R. ROTHER.

The preparation of mineral waters has become a recognized feature in the routine of pharmacy. The mineral water trade is now an important commercial branch of the business, so thoroughly engrafted that it is not considered creditable to a first-class pharmacy which has not all the waters constantly on draught the year around. The methods of manufacture have been greatly simplified, so that nearly all reputable pharmacists feel a particular pride in the circumstance that the artificial mineral waters they keep on draught have been prepared in their own establishment. The notion of extreme, almost analytical, accuracy in their production, has been abandoned as impracticable and useless, which only tended to favor the traffic in perfectly abominable and outrageously misrepresented concoctions of ignorant impostors, who manufacture the mixed chemicals at wholesale. But thanks to the enlightened character of the profession, the millenium of these swindlers has nearly passed.

The methods of preparing the waters by the more recent change, are however, in strict conformity with the analyses, only that unimportant and useless ingredients have been dropped, and the proportions of others brought into more practical limits, without, however, losing sight of the fact that the artificial product must be a practically accurate imitation of the natural water; that it must be based upon a legitimate modification, or scientifically improved interpretation of the original analyses, a wanton violation of which should never be permitted.

Experience has shown that the iron in all waters, excepting Pyrmont, had to be abandoned, on account of objections the consuming public entertained against the ferruginous flavor; and since the waters are mostly used simply as a pleasant beverage, and not as medicine, it was, therefore, highly expedient to conform with public opinion. On practical grounds, it was also found proper to exclude silicic oxide from the waters entirely. No foreign ingredients should be introduced, not indicated by the analysis; and, therefore, organic acids for keeping iron in solution should not be used. Pyrmont is the only water which requires this metal, and in that particular instance it ought always to be introduced into the air-free fountain, which is accomplished readily by first charging with a pressure of about 20 pounds, reopening the fountain, and after adding the iron, preferably in the condition of ferrous sulphate, charging with any desirable pressure, although highly charged waters are always preferred.

The quantities in the formulæ are given in avoirdupois ounces, quarters, eighths, and sixteenths, and the processes are so constructed that no solution need be kept on hand, except the concentrated chloride of calcium and chloride of magnesium solutions. The simple methods, and numbers indicating the quantities admit of rapid extemporaneous processes, and the formulæ are worked out for twelve-gallon fountains, which readily accommodate 100 pints of the finished water.

The application of pure concentrated solutions of calcium and magnesium chlorides cannot be too strongly recommended in preference to the dry fused material as found in the market. Aside from indefinite composition, owing to their strongly hygroscopic disposition, the fused form of these salts is extremely inconvenient for ready manipulation. Moreover, their market price is disproportionately high compared with the product obtained in the form of concentrated solutions. A large quantity made at one operation will suffice even for a great demand during the whole season. The advantage of the liquid form infinitely compensates every disadvantage which the relatively easy process of the manufacture may possess, the most objectionable feature of which consists in assaying the product. But a direct analytic assay is by no means absolutely required, as the strength of the solutions can be quite as accurately found by their specific gravity. By the help of the specific gravity bottle we are enabled to graduate the solutions with ease and precision. After the excess of lime has subsided from the crude solution, the clear liquid is decanted, filtered, and deodorized. The specific gravity is now determined and the solution evaporated or diluted to a volume or weight which bears a simple ratio to the salt it contains. It is more convenient to graduate it by volume, but more accurate to adjust it by weight. The magnesium chloride solution is also treated in a similar manner.

According to Gerlach the specific gravity of a solution of calcium chloride containing 40 per cent. by weight, is 1.40330; 37 per cent. 1.36790; 35 per cent., 1.34430, 33 per cent.; 1.32174; 30 per cent., 1.28789; 25 per cent., 1.23365; and 20 per cent. 1.18222; and of magnesium chloride a solution containing 35 per cent., is 1.33397; 33 per cent., 1.31213; 32 per. cent., 1.30121; 30 per cent., 1.27937; 25 per cent., 1.22737; and 20 per cent., 1.17800. Ordinary commercial chlorhydric acid yields on an average a solution of calcium chloride of the specific gravity 1.3185 without evaporation; containing therefore nearly 33 per cent. of anhydrous salt. One pint of the solution will then weigh 9613.4472 grains and represent 3172 4376 grains, or 7¼ ounces avoird., anhydrous, calcium chloride. Hence it requires but little evaporation to contain half an avoird. ounce in the fluid ounce.

KISSINGEN (RAKOCZY.)

Take of Potassium Bicarbonate, cryst.	⅝	ounces	avoird.
Sodium “	2¾	“	“
Magnesium Sulphate cryst.	3⅝	“	“
Sodium Chloride (pure)	8½	“	“
Calcium Chloride (anhydrous)	2¾	“	“
Water sufficient.			

Pulverize the potassium bicarbonate in a suitable mortar, add the sodium bicarbonate and magnesium sulphate and triturate the mixture after the addition of a pint of water until the potassium and magnesium salts are dissolved. Pour the magma into a No. 50 hair sieve, firmly supported on a funnel inserted in the mouth of an appropriate bottle and wash it through with another pint of water gradually added while constantly stirring with the pestle. Place the sodium chloride in the mortar, add one and a half pints of water, and stir until solution is nearly completed. Then pour the mixture also through the sieve, and follow with the calcium chloride first dissolved in a few fluid ounces of water, carefully washing down any remaining salt, until the whole mixture is brought to the measure of 4 pints. Shake this well, rinse it thoroughly into a fountain containing 12 gallons of water, and impregnate it with carbonic acid, preferably under a high pressure. It must be observed that the calcium chloride should be added last, dissolved in the smallest amount of the available water, because an undesirable effervescence of carbonic acid takes place if the first liquid is not properly diluted before its addition. Should the operator desire the ferrated water, a light charge of about 20 pounds is first put on, so as to free the water from air; the fountain is then reopened, and after the introduction of ⅛ of an ounce avoird. of crystallized ferrous sulphate, again closed and the charge finished as before.

CONGRESS.

Take of Potassium Bicarbonate cryst.	¾	ounces	avoird.
Sodium Bicarbonate	5⅜	“	“
Magnesium Sulphate cryst.	3¾	“	“
Sodium Chloride (pure)	2¾	“	“
Calcium Chloride (anhydrous)	3⅝	“	“
Water sufficient.			

Dissolve the calcium chloride and magnesium sulphate each in 12 fluid ounces of water. Mix the solutions, and after 10 or 15 minutes strain the liquid through muslin with thorough pressure. Powder the potassium bicarbonate by trituration in a mortar, add the sodium chloride and bicarbonate, mix the whole with a pint of water, constantly stirring, and pour the magma through a No. 50 hair sieve, following with another pint of water, then with the calcium and magnesium solution first obtained, and finally with more water, until the united liquids measure 4 pints. Shake the mixture, pour it into a fountain containing 12 gallons of water, and charge with the highest desirable pressure. Or when magnesium chloride can be had, then,

Take of	Calcium Chloride (anhydrous)	2	ounces	avoird.
	Magnesium Chloride (anhydrous)	1 1/2	“	“

Dissolve the salts in a pint of water and mix the solution with the other ingredients, as before, completing the water in the manner directed.

VICHY (GRAND GRILLE).

2	Take of	Potassium Bicarbonate cryst.	5/8	ounces	avoird.
5		Sodium “	10	“	“
1		Sodium Phosphate cryst.	1/2	“	“
4		Magnesium Sulphate cryst.	1 1/8	“	“
3		Sodium Chloride (pure)	1/4	“	“
		Calcium Chloride (anhydrous)	5/8	“	“
		Water sufficient.			

Rub the sodium phosphate and potassium bicarbonate together in a convenient mortar, add the sodium chloride, magnesium sulphate and sodium bicarbonate, stir the mixture with 2 pints of water, pour the magma into a No. 50 hair sieve, and rub it through with the aid of more water. Dissolve the calcium chloride in 4 fluid ounces of water, pour the solution through the sieve, and add sufficient water if necessary to make the whole liquid measure 4 pints. Shake it well, then wash it perfectly into a fountain containing 12 gallons of water, and apply the requisite high pressure of carbonic acid gas.

(SELTERS.)

Take of	Sodium Bicarbonate	3 7/8	ounces	avoird.
	Sodium Chloride (pure)	2 7/8	“	“
	Calcium chloride (anhydrous)	1 1/8	“	“
	Magnesium Sulphate (cryst.)	1 3/8	“	“
	Water sufficient.			

Dissolve the calcium chloride and magnesium sulphate each in 4 fluid ounces of water, mix the solution, let stand 10 or 15 minutes, and strain through muslin with pressure. Mix the sodium chloride and carbonate with a pint of water, pour the mixture through a No. 50 hair sieve, follow with the calcium and magnesium chloride solution, and then with water, until the whole measures 4 pints. Shake up the mixture, pour it into a fountain containing 12 gallons of water and charge with the requisite pressure of carbonic acid. If the magnesium chloride is used, then

Take of	Calcium Chloride (anhydrous)	1/2	ounce	avoird.
	Magnesium Chloride (anhydrous)	1/2	“	“

Dissolve the two chlorides in 8 fluid ounces of water, and add the solution through the sieve to the other materials, completing the process precisely as before.

BITTER WATER (FRIEDRICHSHALL.)

Take of	Sodium Bicarbonate	⅞	ounces	avoird.
	Sodium Sulphate cryst.	1¼	“	“
	Potassium Sulphate	⅜	“	“
	Magnesium Sulphate cryst.	20	“	“
	Sodium Chloride (pure)	10¼	“	“
	Calcium Chloride (anhydrous)	1	“	“
	Water Sufficient.			

Mix the sodium and potassium sulphates by rubbing them together in a mortar. Add the magnesium sulphate with 3 pints of water and stir until dissolved. Introduce the sodium chloride and carbonate, continue the stirring a few minutes, and pour the mixture into a No. 50 sieve, dissolve the calcium chloride in half a pint of water, add it to the other mixture through the sieve, and follow with water if necessary to measure 4 pints, or until the salt is well washed down. Shake the liquid, pour it into a fountain containing 12 gallons of water, and charge it only with a moderate pressure.

PYRMONT (TRINKQUELLE.)

Take of	Calcium Chloride (anhydrous)	2½	ounces	avoird.
	Sodium Carbonate (crystallized)	3½	“	“
	Sodium Sulphate (crystallized)	3⅛	“	“
	Magnesium Sulphate (crystallized)	1⅞	“	“
	Ferrous Sulphate (crystallized)	$\frac{3}{16}$	“	“
	Water sufficient.			

Dissolve the calcium chloride in half a pint of water, and the sodium sulphate and carbonate together in one pint of water, with heat; filter the solution, and while yet hot, add to it the solution of calcium chloride. After 10 or 15 minutes the precipitate will have contracted to a heavy powder at the bottom of the bottle. The supernatant liquid is then decanted without losing any of the precipitate. To the sediment then add the magnesium sulphate, shake thoroughly and rinse it well into a fountain containing nearly 12½ gallons of water. Charge with a pressure of about 20 pounds, reopen the fountain, throw in the ferrous sulphate, coarsely powdered, and finish the charge with a high pressure.

If the residuary calcium sulphate resulting as a waste in several of the formulæ is preserved and dried, the process, with its use, may be modified as follows:

Take of	Magnesium Sulphate (crystallized)	1⅞	ounces	avoird.
	Calcium Carbonate (precipitated)	1¼	“	“
	Sodium Chloride (pure)	¼	“	“
	Calcium Sulphate (dry)	1¾	“	“
	Ferrous Sulphate (crystallized)	$\frac{3}{16}$	“	“

Mix all but the ferrous sulphate with a pint of water, pour the magma through a No. 50 sieve, wash it into a fountain containing about 12⅜ gallons of water, and complete the process with the introduction of the ferrous sulphate and impregnation with high pressure, as before.

SODA WATER AND SYRUPS.

BY JUDSON S. JACOBUS.

The season for soda and mineral waters having come, a little talk and a few formulas will not be out of place.

The question has been asked : " Is not this feature of our business a detriment to the professional standing of a pharmacist ; and is not the money made by it lost in other ways ? " The sale of soda and mineral waters can only be a discreditable or detrimental auxiliary to our business when improperly conducted ; and may be really a benefit to ourselves and to the public, when it is conducted with the same care and honesty as the drug business ought to be.

The modern apparatus for drawing these waters has been brought to such a state of perfection, that, as an ornament, they add much to the appearance of the store, and secure a draught free from metallic poison.

The complaint that it is a source of uncleanliness, does not hold good, as with proper care this is avoided. It certainly is a benefit to the community if we furnish a *wholesome* beverage, that will attract and keep thirsty people away from liquor shops; providing we are not guilty of aiding the curse of humanity, by adding wine or spirits to the otherwise harmless draught. Indulgence in this practice is disreputable, and betrays a low professional standing of the men who do it. No member of our profession should be a transgressor for the pecuniary advantage it may bring, when a moment's thought will convince him how illegitimate and dangerous the traffic is. In the first place, we have not the legal license to sell spirits—by the glass. Secondly, the danger of enticing the employes of such stores by the habitual use of intoxicating liquors in this seemingly harmless manner, when viewed only in its immediate effect.

We know of one instance ; a bright boy, of the age of fifteen, was taken to learn the business, in a store where it was customary to add spirits to soda water, when called for. It became his duty, as the youngest apprentice, to take charge of the soda counter. It was here he tasted his first drop of intoxicating liquor, and although but ten years have passed since then, he now fills a drunkard's grave.

No possible injury can arise from the free use of carbonic acid, or mineral waters, provided they are made to correspond to an authorized analysis, and there is no reason why they should not be so made. Numerous formulas have been published in previous numbers of THE PHARMACIST, and other journals, which will be found practical and satisfactory.

There are so-called pharmacists in this and other cities, who draw the trash called mineral water, made by pop and spruce beer manufacturers, and who sell these unscientific concoctions to these unprofessional dispensers, at exorbitant rates. I will not find fault with their price, for if they would make it still more it might do some good by decreasing its sale.

Any pharmacist could make an infinitely better article at a merely nominal cost.

Formulas for soda water syrups have been repeated so often it would seem a waste of valuable space and time to reproduce them; however, a few improvements may not be out of place.

Fruit juices, with the exception of strawberry, may be made to keep indefinitely by first reducing the fruit to a pulp, then allowing this to stand in a convenient vessel until quite sour to destroy the Pectin. Strain and pour into bottles, nearly filling them. Place the bottles in water, contained in a convenient vessel, and heat to the boiling point. Cork while hot; the corks should be secured with twine, and lastly covered with sealing wax.

For preparing raspberry juice, the red berries are preferable; if the black are used, it is well to add a small quantity of tartaric acid; this will produce a beautiful pink color.

The delicate flavor of the strawberry is liable to be injured by heat or fermentation. A fine flavored juice, however, may be prepared by percolating the recently expressed juice through granulated sugar, contained in a percolator. It should then be bottled, corked and sealed. The whole process should be performed as quickly as possible.

To prepare the syrup of strawberry—

Take of The juice thus prepared, 2 pints.
Water, 1 pint.
Simple syrup, sufficient to make 8 pints.
White of one egg.

Mix and shake well together.

The other fruit syrups may be prepared as follows:

Take of The juice from the fruit, 1 pint.
Sugar, six pounds, av.
Water, 2 pints.
White of one egg.

Mix the juice and water, filter, and in the filtrate dissolve the sugar with the aid of a gentle heat, strain through a muslin cloth, and add the egg.*

ORANGE SYRUP.

Take of The juice of oranges, No. 5.
Oil orange, fresh, 20 minims.
Citric acid, ½ ounce.
White of egg, No. 1.
Simple syrup, 7 pints.
Water, q. s.

Dissolve the acid in the strained orange juice, add the syrup, then the oil, and lastly sufficient water to make one gallon, and mix the whole thoroughly.

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* **Note.**—It is best to mix the white of egg with about four times its volume of water, and pass the mixture through a strainer, previous to adding it to the syrup.—**Editor.**

NECTAR SYRUP.

Take of Spirit of nutmeg, half a fluid ounce.
Spirit of lemon, U. S. P.;
Extract of vanilla, of each 1 fluid ounce.
Simple syrup, 7 pints.
Water, 1 pint.
White of egg, No. 1.

Mix. This may be colored, if desired.

COFFEE SYRUP.

Take of Coffee, best, ½ pound, av.
Granulated sugar, 6 pounds, av.
Boiling water, sufficient.

Having first ground the coffee quite fine, moisten it with part of the boiling water, place in a convenient vessel, cover and let stand 24 hours. Pack in metallic percolator, and gradually pour on the boiling water, until 10 pints of percolate have been obtained. Place the sugar in a percolator, previously closed at the lower end with cotton, pour on the infusion and allow it to percolate.

CHOCOLATE SYRUP.

Take of Chocolate, 8 ounces, av.
Simple syrup, sufficient quantity.
Water, ½ pint.
White of egg, 1.

Grate the chocolate moderately fine, place this in a mortar, and add the egg. When thoroughly mixed, add the water, gradually, and triturate until a uniform mixture is obtained. Finally, add sufficient simple syrup to make the whole measure four pints, and strain through muslin.

Thus prepared, the oil that the chocolate contains is emulsionized. If a good quality is used, and the above directions are followed, an elegant syrup will be obtained.

I obtain the best product from an article called Bakers' half vanilla chocolate.

SARSAPARILLA SYRUP.

Take of Fluid extract sarsaparilla, 2 fluid ounces.
Fluid extract Liquorice, 1 fluid ounce.
Oil of wintergreen, 20 drops.
Oil of sassafras, 12 drops.
Water, 1 pint.
Simple syrup, sufficient quantity.

Dissolve the oils in a small quantity of alcohol; add the fluid extracts and water; then sufficient syrup to make the whole measure one gallon.

OLEATE OF MERCURY.

BY HORATIO N. FRASER.

The preparations of mercury for external use have been experimented on by pharmacists and physicians, since their introduction to medicine, with the view of making a liniment or an ointment which would soften the parts applied to, be easily absorbed, and combine those essential properties with that of a pharmaceutical preparation which would not be obnoxious to the patient on account of its looks or smell.

The ointments of mercury which have been heretofore prepared, are either a mechanical mixture of mercury, or some of its combinations, with lard and cerate, or the ointment of nitrate of mercury, which at best is so unstable in its chemical nature, and so often unsatisfactorily made, that many physicians have been disappointed in its use, where an ointment was indicated, calculated to present mercury in a form to be readily absorbed without causing too much irritation and inflammation that it cannot be used without constant pain to the patient.

Lately a preparation of mercury has been made which seems to answer the requirements of this sort of application better than any of the former—namely, the oleate of mercury, or oxide of mercury dissolved in an excess of oleic acid, and several formulæ have already been published in the pharmaceutical journals for its manufacture.

After experimenting with the several methods, a conclusion was reached that a more satisfactory ointment can be made by separating the acid with which it is made in the shop, although the cost of the product will be somewhat larger.

Oleic acid, as found in commerce, is a light brown colored, oily liquid, with a rancid taste and smell; it is a product from the manufacture of soap, and unless trouble is taken to chill and separate the solidifiable impurities from the acid, the oleate will have an opaque appearance, and the rancid smell observable in the acid, a defect which destroys one of the important features of the preparation, and an hour's experimenting will convince the pharmacist that it will be profitable to take the time and trouble to manufacture the acid himself, at least until it will have come so generally into use that it may be obtained pure from the manufacturing chemist.

Almond oil is used in most of the published formulæ, and makes a good acid, but the product obtained was only about 25 per cent. of the bulk of the oil, and, after examining the amounts of olein in various oils, the oil of cotton seeds, described as " winter oil," which has been deprived of most of its stearin by chilling and pressure, was considered best to use.

It was first saponified with potassa, using a slight excess of the base, then treated with tartaric acid, or any other acid which will make a soluble salt with potassa, until the base is completely neutralized; washed until a mass is left, about the consistence and color of cerate, free from any of the salt; this is heated for several hours with nearly its weight of litharge, and three or four times its bulk of water; the resulting compound is shaken up, while yet warm, with ether, and allowed to stand until all the insoluble matter separates.

This separates the stearate and leaves a nearly pure oleate of lead. The clear liquor is decanted and briskly shaken with dilute muriatic acid, for a few minutes, to precipitate all the chloride of lead, the lighter liquid washed to remove traces of muriatic acid, and filtered, the filtrate heated slowly on a water bath, and the ether distilled until the residue ceases to have an ethereal odor.

The product is about 50 per cent. of the bulk of the oil, a light straw-colored liquid, sp. gr. about 0.800, nearly tasteless, consistence of almond oil in the summer time, and a slight ethereal odor. It has a very slight acid reaction at first, but gradually assumes a more decided acid character, and is pure enough for all practical purposes.

The oxide of mercury used was the yellow oxide, made by adding a solution of corrosive sublimate to a solution of nearly twice its weight of potassa, collecting and washing the precipitate, and drying it at a heat of not more than 120° F.; a higher heat changes it into the red oxide, which is not so soluble in the oleic acid.

This oxide dissolves readily in the acid, by first rubbing them together in a mortar, and keeping at a heat of about 120° F., until they are completely united. The 5 per cent of solution forms mixtures of a consistence varying from that of thick oil to a jelly like, when the proportion of oxide reaches 25 per cent. The color is first yellowish brown, but gradually becomes darker when exposed to the light.

Morphia can be added to the mixture in any desired quantity, by first dissolving it in a part of the oleic acid.

The cost of preparing oleate of mercury by this method would be about three dollars per pound, calculating that three-fourths of the ether required in its manufacture be saved. The difference in quality between this, and that made from commercial acid, will more than amount to the difference in price.

*An ointment can be made by double decomposition between oleate of potassa and nitrate of mercury, and diluted to any required strength with cerate or ointment of rose water, but the product will not have the absorbing power of the excess of oleic acid.

The indications are that this preparation will come into more general use, and will claim the attention of pharmacists to its manufacture.

TINCTURE OF KINO.

BY R. ROTHER.

For what object the pharmacopœia incorporates such a multiplicity of simple astringents, is only a parallel question that can be advanced on numerous other incomprehensible and probably unanswerable positions held by the pharmacopœia.

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* American Journal of Pharmacy, vol. lx., page 159.

Whatever the special merits of catechu, kino, nutgall, rhatany, cranesbill, blackberry, logwood and pomegranate fruit rind may be, is easily summed up in the individual belief of this and that practitioner. But that any of these bodies should have peculiar medicinal virtues not possessed by the others is only a finely drawn hypercritical assumption, based mainly on whimsical favoritism at random conferred, but unsupported by therapeutical difference of quality, in the object of choice.

The tinctures of catechu, kino, nutgall and rhatany are officinal, together with a syrup of blackberry, syrup of rhatany, and fluid extracts of blackberry, geranium, and rhatany. Now either of these astringents is fully capable of replacing any of the rest. They owe their astringency in every case to the presence of some variety of tannin, the only characteristic property of which is identical to the peculiar astringent property of pure tannin. Consequently, pure tannin, or nutgall, its source, is upon reasonable supposition superior as a pure vegetable astringent to the other often doubtful and frequently unreliable substitutes, in the shape of catechu, kino, etc.

However, tincture of nutgall is not much employed for internal use, but a syrup of nutgall, not officinal, but much used in many localities, is highly prized. Catechu is a cheap substance, and when of good quality, is rich in tannin; yet it is not so popular as kino, which, somewhat stronger in tannin, though very unstable in solution, has heretofore been very expensive, and consequently subject to adulteration.

Much difficulty is found in preserving tincture of kino from gelatinizing. Numerous remedies have from time to time been proposed; namely, it was thought that the addition of logwood could prevent the change; alkalies were also tried, but they change the tannin and destroy the astringency. Glycerin came in for its share, perhaps with good effect, and filtration through magnesium carbonate was also suggested. The application of sugar has so far not yet been made; and since the sugar does not prevent an abundant precipitation, in syrup of blackberry, it will perhaps be of little use here. But all concur that an aqueous solution is above all others the most objectionable.

In the administration of these remedies, a large proportion of alcohol is objectionable; nevertheless, alcohol is by all means and preëminently the best solvent and most efficient preservative of tannin and its varieties. The writer takes occasion to propose it here as emphatically preferable to any other menstruum, and the stronger the alcohol, the better it conforms to the object in view.

Strong alcohol exhausts kino more rapidly and efficiently than any other solvent, and the solution never gelatinizes, as it seems that the presence of water, together with a pectase-like substance, causes the deterioration of the tincture. Now as strong alcohol excludes this substance, by reason of its insolubility in this menstruum, consequently a tincture prepared by exhausting kino first with strong alcohol, and diluting the solution moderately with water, that is, so as to bring it to the officinal alcoholic strength, will retain its astringency and fluidity unimpaired by age.

The writer, however, prefers a stronger tincture than the officinal, both in regard to the alcohol and proportion of kino. If the strength of the tincture of kino is doubled, which can be most readily accomplished by means of strong alcohol, the dose will be only half as large by measure, and, therefore, even less alcohol will have to be taken, together with a certain amount of kino, than in the officinal tincture. The mechanical effect of strong alcohol in the exhaustion is also a point of much importance, because the officinal method of manipulation is really a very poor one. The application of sand for effecting a distribution of the powder, which, with the use of the officinal menstruum, rapidly agglutinates, is the veriest nonsense. When a powder cannot be practically percolated alone without producing an agglutinated mass, the intervention of an insoluble solid is not of much avail. Such material can only be satisfactorily exhausted by maceration, either by resorting to the rotation method, or suspending the material in the upper portion of the liquid, by the aid of a net, similarly to the process much used for dissolving the licorice in sticks.

With the employment of strong alcohol, the powder dissolves at once, without cohering in the least; a short period of trituration suffices to effect complete solution of the total soluble matter.

The liquid does not filter readily, but runs through a strainer perfectly clear, leaving the insoluble residue, even after pressure, entirely in the strainer.

The writer prepares tincture of kino as follows:

Take of Kino, 3 troy ounces.
Strong alcohol.
Water, of each sufficient.

Place the kino into a spacious mortar, and triturate it thoroughly; then pour on to the powder half a pint of strong alcohol, and continue the stirring a short time; pour off the clear liquid, after the residue has subsided, and add half a pint more of strong alcohol; triturate again as before, and unite the whole with the first solution; set the mixture aside for about half an hour, shaking it up frequently, then pour the whole of it upon a muslin strainer, and press out the liquid; to the residue add 3 fluid ounces of strong alcohol; press it out again; unite the strained liquids, and complete the tincture by adding water to the measure of 2 pints, and mix.

EUCALYPTUS.

GEO. F. JONES, M. A., SYRACUSE, N. Y.

In that vast island, now described by geographers as the Continent of Australia; in Van Dieman's Land, and other parts of Australasia, as also in the Malay Archipelago, is found, indigenous and in profuse abundance, the tree of which we propose to give some account. The traveler in that land of anomalies, who has seen the bird without wings (apteryx), the quadruped with a duck-bill (platypus), rivers flowing from the sea to the interior, and become familiar with the "black swan," to which supposed impossibility the poet of old likened his "*rara avis in terris*," need feel no surprise at beholding dense forests of gigantic trunks, with vertical leaves, not unfrequently mingled with acacias with no leaves at all, denying him all friendly shade from the relentless rays of a burning sun.

So great is the size, the number and variety of the Eucalyptus, that it seems to hold over large districts, here and there in its native soil, supreme and absolute possession. Let the eye turn where it will, one species or another will present itself to view. Of rapid growth, some varieties attain the height of over a hundred and fifty feet, and a girth of fifty. A plank of a hundred and forty-eight feet in length was seen and wondered at in the great Exhibition of 1851. Sometimes a fallen hollow tree will give the wanderer that shelter from the night which, when alive, it refused him by day. Its wood is most valuable for shipbuilding, and also to the natives, whom it supplies with rude utensils, easily fashioned when green and soft, and when dry, becoming hard as oak. Its leaves give forth a volatile, aromatic, oily secretion, easily recognized when once known, and the bark contains a large quantity of astringent, resinous matter. Even when dried, the leaves, on exposure to moderate heat, part freely with their aroma.

In the vegetable world, the Eucalyptus belongs to the alternate-leaved division of the Nat. Order, *Myrtaceæ*, which furnishes the clove (caryophyllus *aromaticus*), oil of cajeput (melaleuca minor) and the piementa (eugenia pimenta), and is of the sub-order *Leptospermeæ*. It is principally distinguished among the M. by the absence of the corolla, and the limb of the calyx being consolidated into a hemispherical (sometimes conical) cap, which disappears when the stamens expand. So great, however, is the variety of the species, and the variableness of the formation of the leaves, that nothing like a correct botanical distinction has yet been concluded on; but so much inquiry seems now to be directed to the subject that an attempted description, condensed from the most reliable authorities, is offered.

E. Globulus seems, of all the varieties the best known, on account, doubtless, of its therapeutic virtues, which are already acknowledged to be excellent, and, more than ordinarily, general. Messrs. Park, Davis & Co., the eminent chemists, of Detroit, have, in a late circular, given ample details of its merits, and the writer has been favored by Dr. S. G. Armor, of the Long Island College Hospital, Brooklyn, N. Y., with some valuable observations on its successful employment in cases of intermittent fever. This noble variety has been acclimatized in Southern Europe, and hopeful efforts are now being made towards its cultivation in California. In the swampy districts of Algeria, in Northern Africa, where malaria prevailed in a high degree, large plantations of this variety have been made. The trees, happily, have flourished in the humid soil, and the hitherto poisoned localities are now rendered salubrious.

E. Resinifera. Leaves dotted, ovate, lanceolate, long, tapering points, narrowed to the base—vein near the margin. Flowers umbellate, on a compressed peduncle, rather longer than the petole—lid conical, taper, leathery, and twice as long as the capsule. Dark, very astringent, yielding a gum resembling kino, for which it is often sold. This variety is called by the natives the iron-bark tree, from the hardness of its rind. Indeed the general name, Eucalyptus—*the well-covered* —seems to have been given in strict reference to the bark.

E. Robusta. This variety contains large cavities in its stem, between the annual concentric circles of wood, filled with beautiful red or rich vermilion gum, flowing as the instrument of attack makes its incision, to which an almost limitless number of medical and other uses are assigned.

E. Dumosa. An exudation from the leaves of this variety is sometimes spread over large districts, like snow, and even used for food by the natives.

E. Maunifera exudes a saccharine, mucous substance, like manna, though less nauseous. This substance is, it is ascertained, not produced by insects, and appears only in the dry season. It has been observed to coagulate, and drop from the leaves, in particles as large as an almond.

E. Gunnii, when tapped, produces a liberal supply of cool, refreshing, slightly aperient liquid, which ferments and acquires the properties of beer.

Beside these, we find the *E. piperita*, or blue gum, of Port Jackson; *E. calophylla; E. corymbosa;* or *bloodwood of Port Jackson; E. subulata; E. leucadendron* (white tree), and numerous others, of which, perhaps, more anon. Of them all, however, *E. Globulus* seems, by concurrent authority, to be deemed "the noblest representative of a genus that contains upwards of a hundred species;" and the result of some careful investigations of its therapeutic properties, now going on at the writer's personal request, will be given to our readers as they mature.

TINCTURE OF EUCALYPTUS.

Take of Eucalyptus leaves, dry and cut, 1 gramme.
Alcohol of 80° C., 5 grammes.

After ten days of contact, strain with expression and filter.

WINE OF EUCALYPTUS.

Take of Eucalyptus leaves, dry and cut, 30 grammes.
Alcohol of 60° C., 60 grammes.
Good white wine, 1.000 grammes.

Macerate the leaves during twenty-four hours in the alcohol, add the wine, let stand for ten days and filter.

HYDRO-ALCOHOLIC EXTRACT OF EUCALYPTUS.

Take of Eucalyptus leaves, dry and cut, 1,000 grammes.
Water, 3,000 grammes.

Distil to obtain the volatile oil; with the product remaining in the apparatus make an aqueous extract, which dissolve in 1.000 grammes of alcohol at 60°, filter and concentrate this alcoholic solution to the consistence of an extract, and when cold add the volatile oil, mixing both intimately.

SYRUP OF EUCALYPTUS.

Take of Distilled water of Eucalyptus, 500 grammes.
White Sugar, 950 grammes.
Dissolve and filter through paper.

This formula gives a syrup equal to that found in commerce.—*Journ. de Pharm. et de Chim.* 4 *Serie.*, April, 1873.

ON LINIMENTUM CAMPHORATUM. U. S. P.

BY JULIUS B. SCHMIDT.

The American Pharmacopœia is not so precise, in a great many particulars, as would be consistent in a standard which should possess a cosmopolitan character more advanced than any other pharmaceutical guide in the world. The highly mixed kind of our population requires, and most emphatically, that a great deal more attention should be given to the details of executing the formulas. This important point has always received, and very properly, too, a much closer degree of attention in the continental pharmacopœias than with us, which only shows that even there, where scientific progress in pharmacy and allied branches is in a far more developed grade than here, the revisors of official standards did not neglect this most important feature on the plea of the cultured state of the profession, whose rank in science did not require the repetition of superfluous details only intended for instruction of apprentices. Now, when such plainness in the direction of processess was considered necessary there, how much greater, then, is the necessity here, where numberless tyros hold the field in prominent position, and where an apprentice of six months' experience, or a doctor with no experience, can start and run a "high-toned" pharmacy on his own hook? I say it is extremely necessary that the directions for performing the most important part of our business, that is, compounding medicines, should be given regardless of space, in the most elaborate and indubitable detail. I will only refer to one process as a specimen which will bear improvement in this particular, most urgently. In the preparation of oleum camphoratum, the pharmacopœia simply directs to dissolve so much camphor in so much oleum olivarum, but how this should be done it entirely omits to state. Now, here comes the question: there are a great many ways to do things, but usually there is only one right way; and a recognized guide, which a pharmacopœia should be, has no earthly pretext, even with a tinge of justice, to deny this.

One way would be to throw the ordinary fragments of the gum into the oil, and wait until solution is perfect. This process requires about six months, more or less. Another way would be to powder the camphor and mix it with the oil. This also takes longer than is justifiable; but that the camphor should first be powdered, and finely, too, is plain.

Now the right way is—and the Pharmacopœia could easily have given such a method without compromising its dignity—to dissolve the finely pulverized camphor in the oleum olivarum purum with heat. To do this, the gum is first finely pulverized by thorough trituration with a little spiritus vini rectificatus. In the mean time, the oil is heated to a temperature between 140° and 150° Fahrenheit's scale, but not exceeding 150°, the powder then added to it, and stirred until perfect solution takes place, which requires only a few minutes, and the solution strained at once through a flannel or linen cloth. The materials are mixed by weight, and by this we find that no appreciable loss of camphor results from contact with the heated oil. I can recommend this very simple and satisfactory manipulation to all pharmaceutists who have the advancement of the profession at heart, and only hope that the adoption of this process, as well as many other needed improvements in the United States pharmacopœia, will soon be undertaken.

EFFECT OF FILTRATION ON LIQUIDS HOLDING FREE CARBONIC ACID UNDER ORDINARY PRESSURE.

BY R. W. FREDRICKS.

Carbonic acid, in a nascent condition, is largely absorbed by water and aqueous solutions of salts and other substances. In a state of rest, under ordinary atmospheric pressure, quantities of the gas, when liberated in the liquid, are held in apparent solution, which under other circumstances would only be possible by increased pressure. Agitation expels most of the gas, but only by persistent effort can such a liquid be sufficiently freed from adhering gas to bring it into a portable condition, and prolonged boiling can only rid the solution of the last traces of free carbonic acid.

When carbonated water is freshly drawn from a cooled fountain, under heavy pressure, a turbulent effusion of gas occurs. When the liquid is set aside at the usual temperature, the carbonic acid is but slowly given off, but if angular fragments of a hard substance, as, for example, sand, is dropped in, a lively effervescence takes place. A great deal of the carbonic acid can also be separated, as already stated, by shaking the fluid.

It seems, though, that projecting points, about which the free gas can accumulate, and thus issue from the solution, is the most thorough and efficient method by which the surplus gas can be expelled, a principle long known and much applied in distillation of liquids which give off the vapor periodically by unpleasant and often dangerous eructations.

In the distillation of sulphuric acid, this bumping is a great annoyance and can be effectually controled by placing platinum chips in the bottom of the retort before the acid is heated. If, however, the chips are thrown into the boiling acid, the extrication of vapor is so sudden and copious that the evolution assumes an explosive force, shattering the retort, and hurling the hot liquid in all directions. Very disastrous consequences have resulted from the incautious addition of platinum chips to the boiling acid.

When a liquid, supercharged with free carbonic acid, under atmospheric pressure, is poured upon a porous mass, the gas will escape profusely, by reason of the numerous jutting points from which it leaps into the air, and if we use any other easily permeable solid, as filtering paper, for instance, the result is the same. If carbonated water, even when cooled and under high pressure, is poured through a paper filter, the gas is so thoroughly removed that the filtrate will not give off a very perceptible amount of carbonic acid, even by violent shaking. The fibres of the paper act readily as conductors for the elimination of the gas. Other solutions containing excess of free carbonic acid, can be easily vented by filtration. The filtrate is in every instance in a portable condition, and can at once be permanently bottled with perfect security.

This process does not, however, expel the free carbonic acid completely, it only liberates that portion which constitutes the supercharge; the liquid still holds its share of the gas in solution, conforming to its normal capacity as a simple solvent. I find that where time permits in dispensing, the solutions of citrate of potassium, acetate of ammonium and others, if prescribed in moderately large quantity, can always be most perfectly and conveniently freed from excess of gas by filtration. If syrup or mucilaginous substances are to be added, they must be introduced after filtration, as their viscidity would impede the process to an impracticable extent. It is only the simply aqueous portion which can be filtered, the other ingredients, if any prescribed, are finally added.

When solution of acetate of ammonium is prepared by Dr. Piles' method, I find it very expeditious to filter the mixture immediately, through very porous filtering paper. The solution must be poured slowly into the filter, as a lively effervescence always occurs.

PRELIMINARY NOTICE OF A NEW KIND OF PLASTER.

BY L. E. SHAEL.

It is an uncommon practice among physicians to order an aqueous compound and an oily substance together in the form of a plaster. Commonly this case could be managed without producing serious complications, but when the mixture is to be applied upon another plaster, previously spread, then the skill of the dispenser is unduly taxed. Sometimes such directions could not be carried out by common means, and, therefore, it becomes optional with the compounder to change the character of the ingredients, or their proportion and quantity, as prescribed, or make additions which will afford the necessary consistency;

or in the event of non-compliance with the indications, fail in the attempt, and, without really good cause, sacrifice his reputation.

When the prescription is impossible, according to its letter, a conscientious pharmacist will always reserve to himself the necessary license to construe and execute it according to the spirit, as prompted by the occasion, an action justified by common reason, and conceded by the interests of both professions; and hence an operator deficient in this amount of judgment and application is unqualified to serve at the dispensing counter.

The physician desiring a certain combination, writes for a number of ingredients, in the proportion desired; but being himself no pharmacist, therefore utterly unskilled in his art, and consequently expects that the operator, with the proper capacity, will elaborate the requested, according to the art of pharmacy, and the essence of the order.

This, however, does not imply uncalled-for substitutions or mercenary interference with the quantities of expensive ingredients, neither does it confer the privilege of dispensing pills for powders, or liquid mixtures in the place of these, nor does it justify the dispensing of a greater quantity of medicine than the physician directs.

Utterly impossible combinations or dangerous mixtures or doses are of course from *prima facie* evidence, referred to their author for correction or revision. A thoroughly competent pharmacist will never constitute himself the umpire in regard to the pathological merits of any case as appears from a prescription; a doubt in this regard does not find elucidation within the confines of the pharmacal art.

Now, however, if it is ordered to apply to the square inch of surface of a plaster of some particular kind, previously spread, an additional quantity of 5 to 10 grains each of some solid extract and some fixed or volatile oil, then it requires the intervention of another agency which will harmonize these extremely heterogeneous elements. The solid extract must necessarily first be softened with a small proportion of water; it will even then adhere only with difficulty to the plaster, but much more so after the addition of the oily substance, which produces a mixture that in most cases instantly separates when in a state of rest, and possesses no adhesiveness whatever. More oil or more extract would avail nothing, neither would a more solid fatty ingredient be of much consequence, but the incorporation of a moderate quantity of powdered tragacanth affords the desired and required assistance by which the mixture can be made to assume an adhesive, compact and uniform character, and thus be easily applied upon the plaster, which by aid of its exposed margin, will stick firmly and securely to the position in which it is placed on the skin.

Other plasters can be produced by the aid of powdered tragacanth, whereby large quantities of oil or extract can be employed, when spread upon sheets, with an adhesive margin. In every case, the extract is first liquified with water and a small proportion of glycerin, the oily substance added, then thickened with powdered tragacanth, and finally spread upon any desirable base, with an adhesive margin.

ON DORAY'S SYSTEM OF THE EXHIBITION OF PICTURES FOR PUBLIC LECTURES.

Among the means which have been used of late to introduce science to the public at large, the system of projection takes, without doubt, a prominent place. It was first made use of on the occasion of an evening lecture on natural philosophy, at the Sorbonne.

Doray, apothecary in Saint Lô, made this method of demonstration an object of study, especially with reference to economy, for a small auditorium. His apparatus offers nothing new in principle, but it fulfils, in a very happy form, the modest programme which the inventor traced for himself. As a light, Doray uses a petroleum lamp, with a round wick, which offers a white flame and cheap illumination. The apparatus of projection is a simple magic lantern, reduced to its necessary parts, the main expense concentrating in the system of lenses, used to produce the images. The screen is formed by a wooden frame, over which a sheet of paper is stretched, the transparency of which allows the professor to place the apparatus behind the surface on which the pictures shall appear. This arrangement can be used with success for a small audience, though it is inadmissable for a large amphitheatre, on account of the insufficient size of the projected images. What is lost in amplification is gained in light. The lecturer stands between the audience and the table, and the dispersed light, issuing from the lantern, does not disturb the eye by illuminating the atmosphere of the hall.

The objects projected are sketches, made by the professor or his assistant, from pictures of a book, *i. e.*, by means of a black color, consisting of—

Printers' Ink - - - - - - -	5 parts.
Alcoholic Copal Varnish - - - - -	3 "
Oil of Lavender - - - - - - -	1 "

Any figure desired is drawn with this oily and drying ink and a pen upon a plate of glass laid on the picture. Nothing prevents the coloring of this drawing with transparent colors rubbed up with turpentine varnish.—*Zeitsch. d. Allg. Oesterr. Apoth. Vereins, December*, 1872.

THE GREAT PRIZE OF LA SOCIETE D'ENCOURAGEMENT.

The Society gives every ten years a prize of 12,000 francs to the author of the most useful discovery in French industry. This prize was decreed to M. Pasteur, member of the Academy of Sciences, for his works on chemistry, crystallography, on mycodermes, on microscopic organism, the production of vinegar, the ferment of wine and beer, the alterations of, and the heating process for wines; and finally for his researches on the diseases of the silkworm.—*Journ. de Pharm. et de Chem., Mai*, 1873.

COLLATED PRACTICAL RECEIPTS.

Syrupus Lauro-Cerasi (Syrup of Laurel Water).

Take of Laurel Water (Pile's), 1 part.
Simple Syrup, 7 parts.

Mix. This syrup is sometimes prescribed in such large doses that it would not be safe to dispense the syrup of the French Codex, which is one in two.

Spiritus Formicarum.—

Take of Formic Acid. 4 parts.
Acetic Ether, ½ part.
Alcohol,
Alcohol diluted *aa*, 8 parts.

Mix.

Spiritus Sinapis.—

Take of Oil of Mustard (essential), 8 parts.
Alcohol, 480 parts.

Mix.

Asthmatic Pastiles.—

Take of Stramonium Leaves, 2 parts.
Nitrate of Potassa, 1 part.

Reduce to a coarse powder and put up in paper cones, weighing half ounce each.

Balsam of Mecca (Balm of Gilead)—(Factitious).—

The article sold under this name is generally composed of the following:

Take of Gum Benzoin, 2 parts.
Storax liquid, 1½ parts.
Balsam of Tolu, 1 part.
Balsam of Fir, 12 parts.

Place them in a glass flask or bottle, and subject to the heat of a water bath for several hours until liquified, allow to cool and decant the clear portion; to which add sufficient quantity of the oils of lemon, cassia, rosemary, nutmeg and vanilla, to give it a strong aromatic odor.

Another formula is the following:

Take of Gum Benzoin, 4 parts.
Balsam Fir, 16 parts.

Mix and heat, when the gum benzoin is dissolved in the balsam, strain through cloth, and when cold add the oil of lemon, rosemary and cassia—of each two drachms.

Mixtura Oleoso-Balsamica (Balsamum Vitæ Hoffmanni).—

Take of Oil of Lavender,
Oil of Cloves,
Oil of Cassia,
Oil of Thyme,
Oil of Lemon,
Oil of Nutmeg. Of each 1 part.
Oil of Bergamot,
Bals. Peru. Of each, 3 parts.
Alcohol, 240 parts.

Mix.

Elixir Stoughtonii (Stoughton's Bitters).—

Take of Wormwood,
Orange Peel,
Gentian; of each, 5 parts.
Rhubarb, 2 parts.
Cascarilla,
Aloes; of each, 1 part.
Alcohol diluted, 200 parts.

Make either by maceration or percolation. This is one of the numerous stomach bitters of the 16th century, and a Professor Stoughton, of Leyden, is said to have been the originator of this elixir of life? The compound tincture of gentian is a good substitute, and generally dispensed when the Stoughton elixir is not kept in stock.

To Test Beer for an Admixture of Caramel.—To satisfy a fancy of the public the brewer sometimes darkens his beer by means of burnt sugar coloring, thus deceiving the public, for the dark color is thought to indicate a large amount of extractive. The adulteration can be easily determined, according to Dr. R. Schuster. Beer shaken with solution of tannin will be decolorized, but not beer colored artificially with burnt sugar.—*Neues Jahrbuch fuer Pharmacie, Sept.*, 1872.

AMERICAN PHARMACEUTICAL ASSOCIATION.

NOTICE OF ANNUAL MEETING.

The twenty-first annual meeting of the American Pharmaceutical Association will convene at Virginia Hall, in the City of Richmond, Va., on the 16th day of September (third Tuesday), 1873. As this will be the first meeting held in the Southern States, it is earnestly desired that the different sections of our country may be fully represented, and thereby give evidence of its national character, and of a continued and growing interest in the Association. The city of Richmond is easy of access feom all parts of the Union, and presents, with its vicinity, much of historic interest. An excursion to Petersburg, Fredericksburg and

Mount Vernon, is in contemplation. Details relating to the excursion, and to the hotel accommodations for the visiting members, will be shortly announced by the Secretary. Pharmacists and others eligible for membership are invited to forward or present their names for election, and thereby aid in extending the usefulness of this Association. The necessary blanks can be obtained from the Permanent Secretary, Prof. John M. Maisch, 145 North Tenth Street, Philadelphia, Pa.

The exhibition of objects relating to Pharmacy and the collateral sciences, has become a prominent and interesting feature of our annual meetings, and we hereby extend a cordial invitation to all who may have apparatus and specimens of interest, either of their own manufacture or of others, to send them, *prepaid*, addressed to the American Pharmaceutical Association, at Virginia Hall, Richmond, Va.

Albert E. Ebert, *President.*

Chicago, July 1st, 1873.

COLLEGES OF PHARMACY.

TENNESSEE COLLEGE OF PHARMACY.

We have received the first annual announcement of this college, located in the city of Nashville, Tenn. The Faculty are: James M. Safford, M. D., Professor of Chemistry; Thos. Black, M. D., Professor of Materia Medica; Benj. Lillard, Phar. D., Professor of Pharmacy and Toxicology.

The course is to commence Oct. 6th, 1873, and continue until March, 1874.

NEW YORK COLLEGE OF PHARMACY.

The forty-fourth annual session of this college will commence on Oct. 6th, 1873, and terminate March 6th, 1874. The Faculty are: C. F. Chandler, Ph. D., Professor of Chemistry; P. W. Bedford, Professor of Pharmacy; H. De F. Day, M. D., Professor of Materia Medica and Botany; Chas. Froebel, Adjunct Instructor for Analytical Chemistry and Practical Botany.

PHILADELPHIA COLLEGE OF PHARMACY.

The fifty-second session of this School of Pharmacy will commence on Oct. 2d,1873, and terminate about the 1st of March, 1874. The Faculty are: Robert Bridges, M. D., Professor of Chemistry; William Procter, Jr., Professor of Theory and Practice of Pharmacy; John M. Maisch, Professor of Materia Medica and Botany.

LOUISVILLE COLLEGE OF PHARMACY.

The third session of this School of Pharmacy will commence Oct. 6th, 1873. The Faculty are: L. B. Kastenbine, M. D., Professor of

Chemistry; C. Lewis Diehl, Professor of Theory and Practice of Pharmacy; Emil Scheffer, Professor of Materia Medica and Botany.

The introductory lecture will be delivered by Professor Diehl, on the evening of Oct. 6th, 1873.

CHICAGO COLLEGE OF PHARMACY.

The seventh session of this school will commence on Oct. 6th, 1873, and terminate about the first week in March. The Faculty are: N. Gray Bartlett, Professor of Chemistry; James W. Mill, Professor of Pharmacy; D. B. Trimble, M. D., Professor of Materia Medica and Toxicology; Henry H. Babcock, Professor of Botany.

The introductory lecture will be delivered by Professor Trimble, on Wednesday eve., Oct. 1st, 1873.

CALIFORNIA COLLEGE OF PHARMACY.

Through private sources we learn that the opening of the course of instruction in the California College of Pharmacy took place on the evening of July 11th, with a class of 20 to 30 students. This speaks well for a beginning, and we anticipate great results to flow from this far-western teaching school of pharmacy. We are not yet informed who comprise the faculty, but from the knowledge that we have of members of this society, we feel confident that there has been no difficulty in filling the respective chairs of instruction of this school with men who are practically adapted as teachers of the branches entrusted. We extend the right hand of fellowship to our "far-southern" (Nashville College of Pharmacy) as well as our "far-western" (the California College of Pharmacy), and hope to see them fully represented at the meeting of the American Pharmaceutical Association, and the Convention of Teaching Colleges, at Richmond, in September next.

COLLEGE OF PHARMACY OF THE CITY OF NEW YORK.

A regular meeting of the Board of Trustees of the College of Pharmacy of the city of New York, was held on the 5th inst. After reading and approving the minutes of the previous meeting and receiving the reports of the Secretary and Treasurer, and of the Property Committee, a letter from Mr. P. W. Bedford, thanking the College for assistance rendered him, was read. Favorable reports of Committees in regard to the qualifications of candidates for membership were received, and Messrs. William H. Whitney and Charles Corindt were elected members. A report notifying the Board of the withdrawal of the resignation, as member of the Board of Pharmacy, of Dr. William Neergaard, was received. A notice from the Secretary of the College, submitting for the selective action of the Board the names of candidates nominated by the College for the vacancy in the Board of Pharmacy, occasioned by the resignation of Dr. Wm. Manlius Smith, was read. It was resolved to appoint a member of the Board of Pharmacy *viva voce*, and on motion, Dr. B. E. Hays was so appointed. Various communications were received and acted upon, and after the transaction of some business of minor importance, the Board adjourned.

A regular meeting of the members of the College of Pharmacy of the city of New York was held on the evening of June 19th. After reading and approving the minutes of previous meetings, and the transaction of some special business, letters of thanks for election to honorary membership in the college from Prof. Flückiger, Dr. G. Wittstein, Dr. H. Hager, and H. B. Brady, Esq., were read and placed on file. On motion of Mr. Rice, it was resolved that arrangements for the lectures of each course be hereafter made in the month of January of the year in advance of the ensuing session. On motion of Mr. Cassebeer, seconded by Mr. Frohwein, it was resolved that the Lecture Committee make arrangements for conversational meetings of the college, to be held every second Thursday evening at 8 o'clock, in the months of October, November, December, January, February and April. On motion the college then adjourned.

H. A. CASSEBEER. Jr., *Secy.*

EDITORIAL.

RESPONSIBILITY OF PHARMACISTS.

The trial just closed in one of our civil courts should constitute a warning and lesson to all persons dispensing medicine. As we do not propose to discuss the merits of the case, either logically or technically, the details of the trial will not be mentioned. The real point involved was the liability of druggists for the effects produced from taking medicine, even when correctly dispensed, *so far* as was indicated by the *name* of the drug called for. In this instance the common or popular name used was, as is frequently the case, a synonym in common use for several other plants of similar botanical structure, and, therefore, we would say, no name at all; but, as it proved, weighty consequences hung upon even such a name, and the druggist, who dispensed the only article he had in stock to which the name applied, was prosecuted for causing the death of the person who bought it. The charge, as we understand it, was, that the druggist carelessly gave to the person a poisonous drug, when an innocent herb was asked for; and, although the two articles were each known by a similar name by people of different localities, and this synonym for each is also found mentioned in the text books, yet it was maintained by the plaintiff that the druggist should have used sufficient care to ascertain how the drug was to be used, and further, to caution the buyer of its dangerous character. While this caution would have been commendable under the circumstances, still no law exists in this State requiring the apothecary to make such investigation, and no restriction is made as to what he may or may not sell or dispense as medicine, save only in the case of articles known as abortive drugs. Yet be it known, this lack of *restriction* in the law *does not* relieve the apothecary from the damages which may result from his carelessness or *neglect;* for the same rule applies in this as in all other affairs: the carpenter who carelessly lets fall a board and kills a child is liable to be held responsible for the act.

It is to this point that the case brings us: the apothecary must not be guilty of neglecting his duty to the public, who to some extent depend upon his knowledge for their protection, and while it may be difficult or impossible to fix upon him, as in the present case, the charge of careless neglect, yet a suit at law for such an offense is both expensive and uncertain in its results, therefore to be avoided.

Another evil is made apparent, the dispensing of our indigenous plants by the common or vulgar name without careful inquiry as to the properties sought for and the certainty of giving the article wanted. The large number of common synonyms for roots and herbs renders great care needful, and the general lack of knowledge of their properties, many of them not being used by physicians, calls for even greater discretion than the dispensing of well-known remedies.

The question of the responsibility of druggists has many sides, and he is fortunate who has never been brought face to face with the accuser in a legal battle. The reprehensible practice of retailing morphine, laudanum, and other similar remedies, to whoever may call for them is bad enough to call for a special statute forbidding the traffic, and we are in daily expectation of reading of some druggist being punished for doing it. We live in the hope that our State Legislature may some day awake to the importance of, and cease political wrangling long enough, to enact a law to regulate effectually the sale of poisons and kindred medicines. Liberty is not license, and the freedom to *do right* is the only liberty worthy of the name.

Whenever apothecaries shall be so few or so independent as to do their whole duty, irrespective of the question, Will it pay? we shall have less need of restraining laws, and the honorable business of a dispenser of medicines will become something higher and better than that of a mere vendor of drugs.

Meanwhile, we advocate stringent laws for the better protection of the educated and conscientious pharmacist, and for the good of the human family.

EDITOR OF THE PHARMACIST:

In the May number of the *Druggist* an article appeared signed Correspondent (?) and titled, "*A New Antidote for Strychnia,*" attributing to a preparation designated Bromo-Chloralum the marvelous properties of destroying the poisonous effects of strychnia. If such a valuable and indispensable antidote is really in existence, why do all our pharmaceutical journals keep "mum" and our medical journals, excepting the *Druggist,* observe a strict silence on this important subject?

Now, Mr. Editor, as it is a weakness of human mortals to find fault with their fellow-men, I cannot let this opportunity pass by without taking you to task in not giving the discovery of Messrs. Tilden & Co., and that of their correspondent, the deserved circulation by republish-ing the same in the pages of the PHARMACIST, if the statement is of a reliable character, and if not, to refute the same. In concluding our inquiry, we would be pleased if you would answer the following: Is Bromo-Chloralum an antidote to strychnia? Is it the efficient and powerful disinfectant that it is represented to be by its makers, Messrs. Tilden & Co.? If not what is it good for? ENQUIRER.

WATERTOWN, Wis., June 30, 1873.

It is good to sell. Whenever this invaluable (?) nostrum has, by printers' ink, and sundry other aids, made such an impression on the too gulpable public that this is the long-sought-for *panecea*, from comcombating horse disease, scaring away that dreadful scourge cholera, or rescuing the unfortuate victim from the very jaws of death after having swallowed an ounce, more or less, of strychnia. The query of our correspondent recalls to our memory *a little story* we once heard of this highly scientific (?) *Bromo-Chloralum.* It is as follows: This wonderful chemical combination is produced in *nature's* own laboratory, being the residium after the table-salt (chloride of sodium) has by crystallization been removed from the mother liquid of the salt wells. This residium is known to mankind by the vulgar name of "Bittern."

This *waste* has now, by the scientific (?) researches and extensive advertising of Messrs. Tilden & Co., become an invaluable medicinal agent (?) a most powerful disinfectant (?) and the long-sought-for antidote (?) to that heretofore dreaded poison strychnia. This is all we know about it, and our story has come to its end.

We are not given to making physiological or toxiological experiments upon ourselves, and therefore must waive the answer regarding its antidotal virtue. We do not suggest to our correspondent to give it a trial, as his faith in Bromo-Chloralum (taking his enquiry as an indication) is not the strongest, although, should it fail in arresting the effects of the poison, he may immortalize himself by becoming a martyr to the good cause of a progressive science, and thereby practically demonstrate to Messrs. Tilden & Co., and their correspondent, the inefficiency of the antidote. Regarding the disenfecting properties of Bromo-Chloralum, we heartily recommend our correspondent to investigate, and we will be most happy to publish his observations on the subject. All our trials with the article have been of a negative character, so that its properties as a disinfectant have been mythological to us. EDITOR.

PHILADELPHIA, July, 5, 1873.

MR. ALBERT E. EBERT.—*Dear Sir:* I saw in this month's PHARMACIST that you in your criticism on the *Index* say that I did the work without compensation. This is but partially true, and you have been probably led astray by the historical notice, which speaks of my voluntary offer. The case is this: I made a voluntary offer without stipulating any thing at all, but, when the *Index* was printed the College compensated me, and very handsomely too. I think it best that you, Mr. Editor, make some kind of explanation in your next number, out of justice to the College. Yours, &c., HANS M. WILDER.

It is with pleasure that we stand corrected, the error being one of judgment, not one of heart. The correction detracts nothing from the merits of the work performed by the compiler, but adds to the justness of the College in appreciating that "the laborer is worthy of his hire." We again appeal to our readers to provide themselves with a copy of this useful General Index to the American Journal of Pharmacy, which they can obtain by addressing Mr. H. H. Wolle, No. 145 North 10th St., Philadelphia, Pa. EDITOR.

EDITOR OF THE PHARMACIST:

You would favor me very much in publishing a formula for the manufacture of the following mineral waters: Kissingen, Vichy, Congress, Selters, etc., in the PHARMACIST. AN OLD DRUGGIST.

CHICAGO, June 17, 1873.

"Old Druggist" will find the desired formulas in the paper on mineral waters, kindly furnished us by Mr. R. Rother, and published in this number. EDITOR.

Donations received for the Cabinet of the Chicago College of Pharmacy:

From Messrs. Allaire, Woodward & Co., Peoria, Illinois, specimen of Matico Leaves; from Dr. Jos. Willard, Chicago, back Nos. of THE PHARMACIST and other pamphlets; from Chas. A. Heinitsh, Lancaster, Pa., Specimen of Gillinia Trifoliata; from J. Krummeck, Santa Fe, New Mexico, specimen of Honey Ants; from Albert E. Ebert, Chicago, Diagrams for Lecture Illustration.

BOOKS AND PAMPHLETS RECEIVED.

Unofficinal Formulæ published by the Maryland College of Pharmacy for the use of its Membership and Physicians, with the Code of Ethics, List of Members, and Faculty of the College.(?) Second edition, collected and revised by a committee consisting of Prof. J. Faris Moore, John F. Hancock, Wm. S. Thompson, F. Hassencamp, and John H. Hancock.

This pamphlet of 44 pages, containing some 115 formulæ of unofficinal preparations that have some local use in the city of Baltimore and its vicinity, is a practical demonstration of the life and vigor of this college in combating the greatest source of annoyance to the dispensing pharmacist. What is needed is concerted action of the profession throughout the country on this question of formulas for unofficinal medicinal preparations. We have great hope that the

"Elixir swindle," which has grown to such an enormous evil during the last decade, will meet its deserved fate at the hand of the committee appointed at the Cleveland meeting of the American Pharmaceutical Association, and who are to report at the Richmond meeting in September next. The manufacturers of these nostrums "of the period" set up the claim of possessing superior chemical and pharmacal knowledge, and with this gull the undiscriminating medical practitioner into prescribing A. and B.'s unscientific "trash." This is dispelled whenever this mysterious darkness is illuminated with the authoritative "Light" of published formulas, by which the pharmacist can prepare and dispense these, like other medicinal combinations, when prescribed by the physician. We urge our colleagues in the cities where pharmacal associations and colleges exist to follow the good example set us by the craft of the Maryland College of Pharmacy, and we prophesy that ere long the occupation of these impostors would cease. We must remember the old adage, that "The gods help those who help themselves."

The only omission we have thus far noticed in this collection is a formula for essence of ginger, which is a preparation much in use in all sections of the country. The title indicates the publication of the names of the faculty of the college—this was no doubt accidentally omitted. We recommend that in future editions of this useful publication the revisory committee use but one language in compiling the formulas, as a combination of badly-constructed Latin and English words is not creditable to the pharmacist, however common the practice may be with the medical profession, who no doubt claim priority in this method of writing their prescriptions.

We trust the medical journals, as the exponents of medical science, will interest themselves in this subject, and lend a helping hand in the work of elevating the practice of pharmacy to its legitimate sphere of compounding medicines, and in so doing they will strike a heavy blow at the encouragement of quackery in their own ranks. Physicians will some day come to a knowledge of the natural results of prescribing these advertised "concoctions" in the loss of their patrons, who very soon learn to purchase without a prescription any of these "nostrums" with all necessary direction from the nearest drug store.

One of the strongest recommendations used in the popular sale of these preparations is, that physicians prescribe them. The following example will illustrate some of the statements made:

A TOUGH DOSE.—A PATENT MEDICINE OF WONDERFUL PROPERTIES.

[SPECIAL. TELEGRAM.]

Louisville, July 19.—A singular case of poisoning has just been developed here. A short time ago J. H. Attrey, a druggist at Holly Springs, Miss., sold to one of his patrons a preparation of pepsin-bismuth and strychnia, put up by Caswell, Hazard & Co., of New York. According to the recipe, each fluid drachm contains one-sixtieth of a grain of strychnia. The analysis made by Dr. J. P. Barnum shows one-tenth of a grain of strychnia in each fluid drachm. The second dose taken by the purchaser produced all the symptoms of poisoning, and but for the prompt attention of a physician would have resulted fatally. The preparation is a standard one, and is sold all over the country.—*Chicago Times, July 20th,* 1873.

Flint's Practice of Medicine. A treatise on the principles and practice of medicine, by AUSTIN FLINT, M. D. Fourth revised edition. Henry C. Lea, Philadelphia, publisher. One Vol. of 1070 pages, in cloth, $6; in leather, $7. Jansen, McClurg & Co., Chicago.

What shall we say regarding this standard work on the practice of medicine? All our praise would be superfluous, as every practitioner of medicine is fully aware of its value as the best treatise on this subject, and we will only add that the author has thoroughly revised the present edition, and has made such addition as to bring it up with the present progress of the science.

That the publisher has performed his duty, it is only necessary to mention the name of Henry C. Lea, of Philadelphia, which in itself is a guarantee that this work is done equally well. We wish to call the attention of this enterprising publishing house to a book that has long been a desideratum with the pharmacal profession of this country. Students of our schools of pharmacy are without a text-book on Materia Medica, and if the work of Professors Bentley and Redwood, which has just been published in England, adapted to the British Pharmacopœia, were published in this country and adapted to the just published Pharmacopœia of the United States, it would fill the want, and it would seem that such a work would find a ready sale, taking the present rapid growth of our pharmacal schools and the increased attention to the study of pharmacy into consideration.

Ninth Annual Report of the Alumni Association of the Philadelphia College of Pharmacy, containing the Valedictory Address delivered to the graduating class of 1873, by PROF. ROBERT BRIDGES, M. D.

The officers are: President, Clemmons Parrish; Vice-Presidents, E. Chiles, Jos. P. Remington; Recording Secretary, William McIntyre; Corresponding, H. Edw. Wendell; Treasurer, Edward C. Jones. The report is full of interest, especially to members of the Alumni of the Philadelphia College of Pharmacy. Graduates of this school should not neglect to become members of this Association, as thereby they give aid to their Alma Mater, and keep alive the many pleasant remembrances of college associations. The fee is $5, paid but once, which entitles to all privileges of membership, certificate, and published reports.

On Strictures of the Urethra. Results of Operation with the Dilating Urethrotome, with Cases. By. F. N. OTIS, M. D., Clinical Professor of Genito-Urinary Diseases, College of Physicians and Surgeons, New York. D. Appleton & Co., New York.

Report of the State Board of Pharmacy, made to the General Assembly of the State of Rhode Island, 1873.

THE PHARMACIST.

VOL. VI. CHICAGO, SEPTEMBER, 1873. NO. 9.

SODIUM PHENYL-SULPHATE.

BY R. ROTHER.

The earliest observers had noticed that a moderate excess of sulphuric acid was advantageous in the production of phenyl-sulphuric acid. Under all circumstances, however, a part of the phenol obstinately refuses to combine. This residual phenol adheres to the acid, as also to the salts, with the most remarkable pertinacity. So unprecedented is this proclivity that phenyl-sulphuric acid will actually dissolve great quantities of phenol, which the addition of water can no longer separate. Neither can the most usual solvents for phenol effect even an approximate partition. This undesirable tendency is again transmitted to the salts, and these, while crystallizing, or solidifying, carry the strangely intermingled contamination with them. Washing the dried salts with solvents of phenol not common to both substances, (benzine, ether, chloroform), is not at all successful, nor can water wash them perfectly, because the obnoxious pigment is really imbedded within the substance itself, therefore the whole mass will dissolve ere the phenol disappears in the washings. The writer, however, has observed, in the preparation of sodium phenyl-sulphate — therapeutically the most important of these salts, and also one of the least soluble—that the first crop of crystals, equal to about half the weight of the crude phenyl-sulphuric acid employed, is easily decolorized by washing with water. The washed residue forms a heavy mass of brilliant prismatic needles, interlaced in all directions, and free from the contaminating taint. If, now. the mother liquid from which these crystals had separated, be allowed to evaporate spontaneously, the salt will rapidly climb over the walls of the vessel. The capillary action in this case is tremendously powerful; the ascending liquid is readily distinguished at the climax of the ascension, and what is noteworthy, the efflorescent accumulation of the salts is surprisingly pure, so that by taking advantage of this property, the remaining salt, after the first crystallization, can be satisfactorily collected by this method.

Sodium sulphate being more soluble than the phenyl-sulphate, will remain in the mother liquor to the last, until, by successive crystallizations, the sodium phenyl-sulphate remaining in the residual liquid is equal to or less than the amount of sulphate present. The crystallizing salts will then intermingle, but when the solution is very gradually cooled or permitted to evaporate spontaneously, the sulphate is the last to crystallize. It is, however, difficult to separate the salts when mixed in such nearly equal proportions, because water, although dissolving the sulphate more rapidly, also takes up the greater part of phenyl-sulphate along with it. The writer, however, has noticed that when the dry residue is treated with only enough water to form a hot saturated solution with the sodium sulphate, very little of the other salt will dissolve. This forms an excellent device for removing the admixture of sulphate, but it has no effect on the adhering phenol, which again fastens to the salt, after a second crystallization. The phenol imparts but very little color to the solution, especially when slightly acidified, but gives to the salt a decided buff or brownish tinge.

The writer has also made the important observation that all the succeeding crystals, after the first product, are rather more soluble than this, but above all else, that they have a different crystalline form, a much lower density, and a peculiar mother-of-pearl reflection not possessed by the first crystals. These facts would lead to dimorphism in the salt, or difference in water of hydration. The writer has, however, ascertained that no manner of treatment applied to the second salt will produce crystals of the first even, not when the second salt is perfectly decolorized will the crystalline aspect be altered.

Another difference of distinction is that even when the second salt has been obtained, perfectly white and free from phenol, its taste is most nauseatingly bitter, whilst the bitterness of the first salt is less apparent at first, and very much less intense.

Whilst the first salt crystallized in heavy, brilliant, almost colorless masses, unyielding to pressure, the second salt forms in voluminous, light, feathery tufts of crystals, spreading out umbellate from a common point, and which, when compressed, can be reduced to one-eighth their original bulk, yielding a scaly mass, with the peculiar reflection; when dry the compressed mass occupies weight for weight more than twice the volume of the first. The second salt, when decomposed with ferrous sulphate, and treated with alcohol, furnishes a ferrous salt not in tabular crystals, as that produced by the first salt, but an iron combination in the form of minute needles. Bromine likewise throws down from this the usual precipitate of bromo-phenol.

From these different characteristic features, the writer infers that the ordinary white crystallized phenol is either composed of two isomeric, but not identical nor isomorphous phenols, or that the second body, so largely present, is an allotropic modification of the ordinary phenol. In either case, it would seem proper to give it a distinguishing epithet, and designate it as para- or meta-phenol.

The writer will now detail the process he has found for purifying the second salt, by perfectly bleaching and deodorizing it, in removing the attached phenol.

This procedure applies only to the sodium salt, but the writer believes that most of the phenyl-sulphates can be purified by a modification of the process. The most soluble will probably be the most difficult to purify.

Calcium phenyl-sulphate cannot probably be prepared pure unless pure phenyl-sulphuric acid is directly applied, owing to the exceeding solubility of the calcium salt.

It was found when strong solutions of calcium chloride and calcium phenyl-sulphate were mixed, that the phenyl-sulphate was precipitated, the calcium chloride absorbing the watery medium which held the other in solution.

But when calcium phenyl-sulphate and sodium chloride were mixed in concentrated solution, double decomposition ensued, and sodium phenyl-sulphate was precipitated, the resulting strong solution of calcium chloride, preventing the solution of the phenyl-sulphate. The writer now applied sodium chloride directly to a solution of sodium phenyl-sulphate, and made the observation that the phenyl-sulphate was completely precipitated. The slightly acidified solution was treated with sodium chloride to saturation, and the precipitate collected on a muslin strainer, and pressed. This manipulation separated the sodium sulphate, and most of the phenol which remained dissolved in the acidified saline solution, the salt in this case being incapable of precipitating the phenol. However, the precipitated phenyl-sulphate was still colored with the peculiar buff, the strong affinity between it and phenol was not relaxed by the intervention of salt. The residue was now dissolved in hot water, and on cooling crystallized, but colored as before. The salt which had remained in the liquid of the pressed mass, and which now existed in the mother liquor, was a valuable adjunct in aiding the phenyl-sulphate to crystallize, since this was much less soluble in the water containing sodium chloride than in the liquid containing sodium sulphate. No sodium chloride crystallized until the phenyl-sulphate was totally absent.

It now became necessary to decolorize the salt from which the sodium sulphate and excess of phenol had been removed. For this purpose the writer applied animal charcoal, and succeeded perfectly.

The sodium phenyl-sulphate precipitated with sodium chloride, was gathered on a muslin strainer, pressed, and dissolved in its weight of water, with heat; animal charcoal was now added, in the proportion of 1 to 16, or 20 of the salt, the heat continued a few minutes, filtered hot, and the colorless liquid allowed to cool gradually. After pressing the resulting crystalline mass in a muslin strainer, the residue was mixed with its weight of water, again pressed and dried; the strained liquids were mixed, evaporated, and further treated as before. By this process all the phenyl-sulphate was secured, practically speaking, without loss.

Hager gives, as the best proportion for mixing the phenol and sulphuric acid, 10 parts, by weight, of the first and 12 of the second. The writer has adopted this proportion for preparing phenyl-sulphuric acid, and proceeds as follows: The crystallized phenol is placed into a suitable porcelain capsule, and carefully crushed with a pestle, and the sulphuric acid is then gradually poured in, with constant stirring. The first result of the combination is the solution of the phenol, accompanied with a considerable reduction of temperature occasionally, so excessive as to congeal the mixture again before all the sulphuric acid has been added; finally, when all the acid is incorporated, the mixture will have become liquid a second time, immediately succeeded by a rise of temperature, until the liquid has become very hot; after cooling it is transferred to a bottle, well stopped, and set away in a warm place for about 24 hours. The combination, which was at first very fluid, has by this time become thick and viscid, and if it be placed cool, it will firmly crystallize in a short period after. If, however, the mixture remains in the capsule it absorbs water from the atmosphere with avidity, becomes more fluid, and does not subsequently crystallize.

Before neutralization, when consumed in the manufacture of its salts, it should not be excessively diluted, from once to twice its volume of water is ample. In preparing the sodium salt, the sodium carbonate in small fragments is gradually added to the diluted acid, with occasional stirring, until the liquid is only slightly acid; the magma is then pressed; the residue dissolved in nearly its weight of water, with heat, set aside to cool, and the crystals and liquids separately treated as above explained. It would seem, therapeutically considered proper to mix all the crystals obtained in the whole process. Yet it is highly probable that the first and second products are chemically distinct.

In order to derive some clue as to their chemical composition, the writer determined the amount of hydration, and applied the analogy of Laurent's formula for the phenyl-sulphates:

$$M'(C_6H_5)(SO)_4+aH_2O$$

which the writer had verified by his new and direct method of analysis, (PHARMACIST, November, 1872), in the case of ferrous phenyl-sulphate. 100 grains of the second sodium salt, which the writer, for the sake of convenience, will designate the B salt, and which had been previously pulverized and air-dried, was subjected to a water bath heat until the weight remained constant. The residue weighed 98.45 grains, but after cooling and a few hours exposure, the original weight had been again restored; therefore the writer concludes that the B salt is anhydrous, and that the hygroscopic tendency, owing to its loose condition, had absorbed the 1.55 grains. 100 grains of the first salt (which the writer chooses to distinguish as the A salt), which had been pulverized and air-dried, was subjected to a water bath heat until it ceased to lose weight. The residue weighed 87.2 grains, leaving for water of hydration 12.8 grains.

Now, applying Laurent's formula for the sodium salt, we have

$$Na(C_6H_5)(SO_4)xH_2O \text{ where } xH_2O=12.8 \text{ grains,}$$
$$Na(C_6H_5)(SO_4)=196 \quad H_2O=18$$

but 87.2 grains corresponds in the salt to the number 196, and 12.8 to x (18). The writer has based the calculation only upon sodium, but the whole anhydrous group would have been more direct and convenient.

The sodium will correspond as 196 to 23, that is:

$$196 : 23 :: 87.2 : 10.232:$$

The proportion will be sodium 10.232 and water 12.8 grains, dividing 10.232 by the equivalent of sodium (23), and 12.8 by the equivalent of water, 18, and we have

$$Na=.445 \quad H_2O=.711,$$

Dividing both numbers by the sodium result, we have 1 to 1.59, or nearly 2 to 3. Constructing from this the salt, we have

$$2(Na.C_6H_5.SO_4)\ 3H_2O,$$

with a molecular weight equal to 446. Calculating from this the per centage of hydration, we have 12.108, but since 12.8 was found, there is a difference of .692 grains. It was, however, shown from the B salt, that the salts are slightly hygroscopic, therefore the trivial deviation from the theoretical quantity is explained. Hence, we have for the A salt $2\ (Na(C_6H_5)(SO_4))\ 3H_2O$, for the B salt simply $Na(C_6H_5)(SO_4)$.

PARASITES DISGUISED AS AUTHORS.

BY GEORGE F. DECKMAN.

A perennial species belonging to the genus *Piratus;* Natural order IGNORANTACEAE is found luxuriating in the boggy districts contiguous to the East River. Another fine specimen was lately discovered in a more southerly latitude, the historical diggings known as the "dark and bloody ground." The magnificent appendage first announced is now the engrossing centre for special and extended observation. This vicious excrecence has, almost unperceived, obtained such an alarming foothold upon American pharmacal literature, and has assumed such a malignantly contagious attitude that it has been firmly resolved to weed it out effectually, before its pernicious examples have matured by producing emulators. True scientific votaries are grieved at the deeply injurious reflections which fall upon American pharmacy, and its representatives, through the persistent and grossly mischievous machinations, contrived for mercenary ends by irresponsible and reckless schemers. Therefore, only upon duty's call, the painful effort is inaugurated, to expose the fraud and again maintain fair play.

As the grand sacnem among loud-mouthed and brazen browed imposters, scientific frauds, and literary sharks, J. L. A. Creuse, Brooklyn, New York, carries off the palm, like a tornado. An advertising leaflet, now extinct, once had a precarious and inglorious existence under Creuse's pharmaceutically editorial supervision, although it was owned and published quarterly by Reed, Carnrick & Andrus, New York, nostrum compounders on the large scale.

As a literary kleptomaniac Creuse has arrived at the incurable stage. His undaunted presumption is without a rival, and as to downright ignorance, he stands unapproached. Yet these peculiarities he owes more to national traits than to educational faults; or, in other words, he was well brought up in a very poor school.

His first public act recorded in print, aside from anonymous tendencies and translations, consisted in establishing a new constitutional schedule for the sulpho-carbolates. And in surprise it may be asked, did Laurent's ghost not haunt him? No, certainly not, the intellectual nobody who cannot add simple numbers correctly, who has not mastered the multiplication table yet, and who does not comprehend the first rudiments in arithmetical methods. is even too attenuated for communion with the spiritual condition.

Then, is it possible that such a sham should find a new combining law, and be permitted to distort and ridicule a savan's noble aim and high endeavor? But how preposterous still more that he should be endorsed, quoted, and even copied into THE PHARMACIST, with *grand eclat.* With that traditional *elan* he captured a flattering recognition from most all the pharmacal journals, although his incongruous productions were fragile to the look. The marvelous discovery sets forth (*Pharmacist*, Feb., 1871), that sulpho-phenic acid is not constituted thus: $SO_4(C_6H_5)H$. (Laurent)

but thus: $3\ (SO_4).\ 2(C_6H_5).H_4$,
as barium salt, $3Ba''\ 6\ (SO_4)\ 4\ (C_6H_5).H_2$,
or old notation $C_{12}H_5O,\ 3S\ O_3,\ 2\ H\ O$,
as barium salt, $3\ Ba\ O,\ 6\ S\ O_3,\ 2C_{12}H_5O,\ H\ O$,

in other words, a chemical absurdity.

To prove all this he pretends to have made numerous experiments, elaborate and accurate, but which to a half-practiced eye appear as though they were performed by an apprentice, with a sugar scoop and grocer's scales. With delicate precision he obtains his carefully collected precipitates, only in quantities expressed in grains and half grains. But in the calculations he derives superbly complex decimals correct to the second place, which shows his skill as a weigher and shrewdness as a calculator.

Among the numerous heavy points pulled in by the ears is one relating to the proportion in which the phenic acid can only be completely combined with the hydric sulphate, namely, that since (as he claims to have demonstrated,) one equivalent phenic acid combines with three equivalents sulphuric acid, there must be six equivalents sulphuric acid present. All the mixtures which contained the two acids in less than that proportion always left some phenic acid uncombined, whereas, in the mixtures which were composed in that manner, or contained still more hydric sulphate, the phenic acid was invariably absorbed to the atom.

The analytical operation by which the sulpho-phenic acid's composition is determined is really *unique*, and shows the investigator's characteristic tendencies in a most admirable light. The two acids in fixed weights, as already explained, are mixed, and after the required digestion, 100 grains, are taken from the mixture and examined. The invariably indefinite sulphuric acid, owing to its unreliable hydrated condition, he adopts as the basis for his elaborations, and the calculation begins, *a la* old notion.

Since the mixture contained, per manipulation indefinitely, hydrated phenic acid one equivalent, and equally variable sulphuric acid 6 equivalents, or, as he has it in numbers, phenic acid 188 and sulphuric acid 607, together $188+607=795$ parts, therefore this mixture, in 100 grains, was composed phenic acid 23.65 grains and hydric sulphate 76.35 grains. Now in this simple calculation the first error appears, because 12 times 49 is not 607, but only 588, therefore 188 + 588 = 776, consequently the mixture in 100 grains, if otherwise correct, should contain phenic acid 24.23 grains, and hydric sulphate 75.77 grains. He finds, however, by direct weighing, that the excess in hydric sulphate is represented by the 92 grains barium sulphate. But as this agrees with 38.69 grains hydric sulphate, thus: $BaO, SO_3 : SO_3HO :: 116.5 : 49 :: 92 : 38.69$, hence 6 equivalents hydric sulphate or all the sulphuric acid in the mixture should be twice 38.69 = 77.38, and not 75.77 nor 76.35 grains. This again illustrates with what exquisite accuracy his work was conducted. As the combined sulphuric acid should correspond with only half as much barium sulphate as the excess, owing to the fact that one equivalent, barium sulphate, precipitated from the salt indicates only half the sulphuric acid in actual combination with the phenic acid, therefore the precipitate 'a' 41 grains barium sulphate should have been 46 grains, or exactly half as much as precipitate 'c,' providing that result was correct. 41 grains barium sulphate indicates 17.25 grains hydric sulphate, then twice this, or 34.5 grains was the amount in actual combination with the phenic acid; double this, or 79 grains, according to this result, ought then to have been all the hydric sulphate present in the mixture, and not 76.35, nor 75.77, neither 77.38 grains. The phenic acid corresponding to these 41 grains barium sulphate is 33.08 grains, thus; $BaO.SO_3 : C_{12}H_5O.HO :: 116.5 : 94 :: 41 : 33.08$, and not 23.65 grains, as he supposes to have it, even by direct weight. This last result clearly and indisputably proves that the mixture in 100 grains contained 33.08 grains phenic acid, together with 34.5 hydric sulphate combined with the former. Now, taking for granted that the 92 grains barium sulphate gave the actual excess which was not combined with phenic acid, that is 38.69 grains, therefore there must have been present 34.5 + 38.69 = 73.19 grains hydric sulphate; adding to this the 33.08 grains phenic acid and 106.27 grains results, in lieu for the 100 grains with which he originally started. This shows, firstly, the total inaccuracy attending the analytical work, and, secondly, that the mixture from the beginning did not contain phenic acid 23.65 and hydric sulphate 76.35 parts, but rather was composed, phenic acid 33.08 grains, and hydric sulphate 66.92 grains, or phenic acid one equivalent and sulphuric acid somewhat less than 4 equivalents. The barium oxide, as he derives it from the 41 grains barium sulphate, is 27.22 grains, corresponding to 3 equivalents metallic base in the sulpho-phenate formed. This, however, is only another little oversight in his figures; it should be barium oxide 26.92 grains, thus; $BaO.SO_3 : BaO :: 116.5 : 76.5 :: 41 : 26.92$.

Therefore, unbeknown to himself, has he verified Laurent's original formula, which is even apparent from his most barbarously crude and inefficient work. and actually demonstrated through a *reductio ad absurdum* that his wild, imaginary flights are prompted by the barest myths. Thus adding, in his sad experience, to the primal caution that children should not play with tools.

The experiment with which he proves it impossible to combine the acids completely when only equivalent proportions are taken, he performs by mixing one equivalent phenic acid and two equivalents hydric sulphate, that is, phenic acid 94 and hydric sulphate 98 parts. 100 grains will then, by calculation, contain phenic acid 48.95 grains and sulphuric acid 51.05 grains. The precipitate "c," barium sulphate 9 grains, indicating hydric sulphate in excess, represents 3.78 grains uncombined sulphuric acid. Precipitate 'a,' barium sulphate 49 grains, shows that 39.53 grains phenic acid and 41.22 grains sulphuric acid had combined, leaving 9.82 grains hydric sulphate over. Now, since only 3.78 grains have been accounted for, where are the other 6.04 grains? Echo repeats, where? It is probably due to careless operating, or perhaps to excessive hydration in the very hygroscopic acids employed.

The other investigation elucidates the combination produced by mixing phenic acid one equivalent and sulphuric acid one equivalent, that is, 94 and 49 grains respectively, or in 100 grains, phenic acid 65.74 grains and sulphuric acid 34.26 grains. This is the highly unscientific and radically inconsistent proportion suggested by Frederick Hoffmann, New York, (*Pharmacist*, April, 1870, page 88), and copied by T. Omar Guy, (Amer. Jour. Pharm., May, 1870,) which must be digested as Hoffmann directs, until, when diluted with water, no phenic acid separates, showing thereby that this has all combined. But this mixture might endure an eternal digestion, and yet over half the phenic would remain in excess, and still not precipitate when diluted with water, because the sulpho-phenic acid formed holds the former permanently and abundantly in aqueous solution. It is almost impossible to purify the salts contaminated so largely with free phenic acid, particularly the most soluble ones.

Creuse finds that in this case precipitate "c" is a most trivial quantity (1½ grains), expressing only a diminutive remnant of hydric sulphate in excess. But precipitate "a," barium sulphate 37 grains, shows that 29.85 grains phenic acid and 31.12 grains sulphuric acid had combined. Thus:

$$BaO.SO_3 : C_{12}H_5O.HO :: 116.5 : 94 :: 37 : 29.85, \text{ and}$$

$$BaO.SO_3 : SO_3HO :: 116.5 : 49 :: 37 : 15.56, \text{ and } 15.56 \times 2 = 31.12,$$

showing $65.74 - 29.85 = 35.89$ grains phenic acid and $34.26 - 31.12 = 3.14$ grains sulphuric acid in excess.

In these two last experiments the discrepancies are not quite so aggravating as in the first instance; a few grains more or less in an analysis is perfectly consistent with Creuse's experimental system. His theoretical adaptability levels the inevitable irregularities occurring in practice. However, these two last results might have taught him a wholesome lesson, had his application not suffered from his overpoweringly magnificent *coup d'œil* which enabled him to take the situation in at a glance, and consequently that wonderful discovery was "all in his eye"—fraud, thy name is Creuse.

Creuse next published a new process for producing pure barium carbonate (*Physician and Pharmaceutist*, for February, 1871), because his method for making sulpho-phenic acid consumed this in comparatively large quantities, and therefore rendered the already extravagant process still more expensive, unless the barium carbonate could be furnished cheaply.

The introduction to his paper portrays the blankest ignorance on record, but it is exhibited with such assurance and reckless audacity that one almost unconsciously respects such a rampant ignoramus, if for nothing more than his presumptuous dash. As a sequence to the intellectual and industrious student appears the erudite and accomplished scholar. Then from Creuse's highly diligent and excessively active spirit, we must infer him to be a wonderfully precocious youth, or a brilliant genius striding before the age. Let him be dubbed the *avant courier* to a new dispensation in the scientific code. And why not? "The imperfection in the *only published* process for refining the native carbonate, which consists in first transforming the mineral *Witherite* into barium sulphate, and then converting it into sulphide, by calcination with charcoal, is long, expensive and wasteful."

Would not one have to be a little *coup de hache*, like himself, to swallow this luscious dose.

Who ever dreamed such *bizarre* ideas? Barium sulphate is just one stage behind the carbonate. Progressive practical science would not very likely retrogade from the advantage nature has presented, and swing around a circle, through the sulphate, and arrive no further than the original starting point.

Pure barium carbonate is easily and cheaply made, from the native Witherite, by dissolving this in chlorhydric acid, crystallizing the barium chloride from the solution, re-dissolving it in water, and precipitating with pure sodium carbonate.

When the native barium sulphate, *heavy spar*, is employed, several methods are pursued which have long been standard processes to be found in any text book on chemistry. Heavy spar is a very cheap but extremely refractory mineral; yet nearly all the barium compounds used in the arts are prepared from it. The finely ground mineral is strongly heated in contact with charcoal, or some other carbonaceous substance which converts it into sulphide, thus

$$Ba''SO_4 + 4C = BaS + 4CO.$$

From the dissolved sulphide the artificial sulphate is precipitated with sulphuric acid, thus

$$BaS + SO_4H_2 = BaSO_4 + H_2S,$$

and the artificial carbonate, by passing carbonic acid into the solution thus

$$BaS + CO_2 + H_2O = BaCO_3 + H_2S.$$

For preparing the barium compounds on the small scale from the heavy spar, this is first converted into carbonate by fusing it with a mixture of dry sodium carbonate, potassium nitrate and charcoal. The decomposition is indicated thus—

$$BaSO_4 + Na_2CO_3 = BaCO_3 + Na_2SO_4.$$

Barium chloride on the large scale is generally manufactured by fusing heavy spar with calcium chloride in a reverberatory furnace. Thus

$$BaSO_4 + CaCl_2 = CaSO_4 + BaCl_2.$$

The resulting mass is rapidly extracted with hot water, and the clear solution is decanted and evaporated. The pure barium chloride is readily obtained in tabular crystals, $BaCl_2 . 2HO_2$.

Creuse's celebrated improvement consists in neutralizing chlorhydric acid by adding native barium carbonate in excess, decanting the clear solution and adding oxalic acid in excess, or as long as a precipitate is formed. After an hour the liquid is filtered and rendered slightly alkaline with sodium hydrate. After boiling, or standing five or six hours, the liquid is again filtered and precipitated with sodium carbonate.

"This process is founded on an observation made by himself, that when oxalic acid is added to a solution containing calcium and barium chlorides, all the calcium is first and immediately precipitated as calcium oxalate, while the barium is only affected after some time."

Now, is not that a remarkable discovery. Common sense would teach that also, because barium chloride is not disturbed by oxalic acid under such conditions, only when their saturated solutions in equal volumes are brought together will some barium precipitate as acid oxalate.

Then, again, he adds the sodium hydrate purposely, for removing iron, copper and lead, when it is evidently impossible for them to be present, because, in the first instance, the barium carbonate in excess would prevent their solution.

However, the sodium hydrate, by neutralizing the oxalic acid, had this been added in excess, would now precipitate the barium oxalate, consequently, after filtering and precipitating with sodium carbonate, no soluble oxalate would remain, and hence none would occur in the washings.

Such bold misrepresentations almost create an admiration for lying. But Creuse, where will you end?

The next in order on the tapis (*Physician and Pharmaceutist*, February, 1871), consisted in *appropriating* (putting it mild) the process for converting diad into triad iron, with potassium chlorate, as proposed by R. Rother in THE PHARMACIST, July, 1869, and subsequently again, PHARMACIST, April, 1870.

It will be well to understand, however, that potassium chlorate was long before this used for the same purpose. Mr. Mowbray, England, published in the *British Pharmaceutical Journal*, February, 1844, a method for preparing Tinctura Ferri Sesqui-chloride by oxidation with potassium chlorate. The process, however, was faulty, and the reaction incorrectly expressed; and, as Mr. Mowbray had previously made himself obnoxious by some means or other, he, together with his process, was effectually done with, under the irate Phillips' relentless pen (*Pharmaceutical Journal*, March, 1844). Moreover, Wittstein, in his treatise on Preparing and Testing Chemical and Pharmaceutical Products, employs potassium chlorate for preparing ferric monohydrate by boiling ferrous carbonate with potassium chlorate.

But, *venir au fait*, Creuse affirms "that the best method, undoubtedly, for preparing the ferric sulphates *perfectly pure*, is to pass chlorine through the dissolved ferrous sulphate, previously properly acidulate with the necessary sulphuric acid. But this is obviously impracticable to " such a progressive *Pharmacien par excellence.* Creuse undoubtedly believes that passing chlorine through the solution means to run it in at one end, and out at the other, similar to an electric current, for that would be Creuse out and out. That the chlorine enters into combination with the abstracted hydrogen, forming free hydro-chloric acid, has never penetrated through his dense occipito-frontalis. He had never pictured to himself that the reaction is thus:

$$6(FeO.SO_3) + 3(SO_3.HO) + 3Cl = 3(Fe_2O_3.3SO_3) + 3HCl.$$

Or, taking ferrous sulphate without additional acid, thus:

$$6(FeO.SO_3) + 3Cl = Fe_2Cl3 + 2(Fe_2O_3.3SO_3).$$

Another marvellous discovery is that the gases arising during the officinal operation are poisonous; this is, assuredly, a valuable conquest for medico-legal advancement. Hereafter, nitrogen tetroxide is poisonous—Creuse has decreed it!

His mathematical powers now come into play, or, perhaps, his optic nerve suffers from frequent spasmodic aberrations, and does not convey the retinal impression at all times correctly, for he failed either to copy or calculate the potassium chlorate accurately.

In the formula for normal ferric sulphate the potassium chlorate is given as 348 grains, when the proper quantity is 423.7 grains. Can this be, that Creuse, who never promulgates facts that he can't substantiate, (?) should publish a process he has probably never tried?

But the puissant point appears, with the same process he also prepares the basic ferric sulphate (liquor ferri subsulphatis); but unrivalled theorist and calculator! Only 340 grains potassium chlorate will answer to transform 12 Troy ounces ferrous sulphate into triad iron, which latter is exactly the same quantity as in the first formula, but, wonderful to tell, 340 grains potassium chlorate will have to suffice, for he figured, or, at least, attempted it, according to the nitric acid apportioned in the officinal formulas. The *grand tableaux*, fizzle and *finale*, however, transpires in the utter impossibility to prepare ferric subsulphate by this process, since the deficient acid gives the triad iron, which is naturally antagonistic to strong combinations, the greatest scope for generating highly basic insoluble oxysalts with the chlorhydric acid present, thus forming less rapidly in the cold, but almost immediately, when heated, a pale yellow precipitate. This ferric oxychloride, similar to all other ferric salts within this category, is but sparingly soluble in water or the mineral acids, either strong or dilute.

When the precipitation has once begun, regardless whether in the cold or with heat, the oxychloride separates quickly, as a heavy, compact, granular mass, and in a fluid no more dilute than the solution which Creuse professes to evaporate to 12 fluid ounces, and then *filter*, it will cause the whole liquid to set into a solid cake, which can be easily cut up with a spatula into any desirable shape. Now this is really too thin for ready deglution, yet still not sufficiently attenuate for filtration, unless Creuse has discovered a new method for passing solids through paper, which separates the molecular aggregation sufficiently to assume the liquid state after passing through at the inverse side, or perhaps he induces it, by some undescribed affinity, to circumnavigate the edges. By all means Creuse should either immediately *patent* it, or publish the process at once, so that pharmacists could make the nondescript concoction for their home supply.

In the *Physician and Pharmaceutist*, (now re-baptized the *Physician and Pharmacist*,) for August, 1871, Creuse is out in an article on citric acid, and his newly-discovered *quadruple citrates*, however, he does not describe these *new* combinations especially, but only announces their discovery by *himself*. The main feature in that *furore* creating document is a *new* method for estimating and determining citric acid in all possible combinations. This is followed by a descriptive section on certain bismuthous double citrates, *recently discovered by him*, and whose composition he has *analytically* determined.

Firstly, he shows by *direct* analysis how simple bismuthous citrate is composed; then he passes on to the well-known ammonio-bismuthous citrate, whose composition both in the dry and the dissolved state he *analytically* establishes; following this, he *minutely* describes the bismuthous double citrates with potassium, sodium, and lithium, which "he' believes have never been mentioned or obtained yet by anybody."

"He has not obtained these compounds in scales yet," because, "his study on the citrates is far from being complete." Just so; therefore, "he has not been able to determine their hydration," but for the present he is satisfied to call it *n*HO. Exactly. Now, would it not have been unpardonable and inconceivable narrow-sightedness if the many distinguished writers on bismuthous citrates had believed that the ammonium salt could be the only possible one? The European chemists, Heinrich Rose, Spiller, Heldt, Kaemmerer, and numerous others who investigated the citrates, always employed the fixed, alkaline, metallic bases in preference to ammonia for constructing double citrates. Moreover, Mr. A. E. Ebert, in his paper on liquor bismuthi, (*Amer. Journal Pharmacy*, Jan., 1866,) had conclusively shown, when precipitating bismuthous citrate with potassium hydrate from the normal bismuthous nitrate mixed with citric acid that the alkali in excess would totally re-dissolve the precipitated citrate, producing thereby the potassio-bismuthous citrate in permanent solution. Mr. Bartlett, (*Amer. Journal Pharmacy*, Jan., 1865,) found the formula for ammonio-bismuthous citrate, by direct analysis, to be thus:

$$NH_4O,\ BiO_3.\ C_{12}H_5O_{11}\ 5HO.$$

The following exposition will now explain to the firmest believers in Creuse, that his purported analytical doings about bismuthous citrates is, thus far, the absurdest, shallowest show he has yet attempted. On closer view it becomes evident that the analyses were wholly performed on paper, (Creuse's best hold), but somehow or other they did not pan out well in the end. The transparency is even more ludicrous than any previous effort.

But whoever says that Creuse is not an advancing genius, lies—under a ponderous misconception. He has now adopted the latest improvements in analytical chemistry, and employs the metric weights.

Heretofore he never condescended beneath a half grain, in his practical operations, but now he is enabled to approach the truth within a milligram. Go in, noble youth, let your right hand know what your left hand doeth. It is pleasant to hear that you are beginning to tell the truth. Anything for a change. This monotony would murder us all with *ennui*.

Two grammes bismuthous citrate is decomposed with potassium hydrate in excess, the resulting bismuthous oxide weighs 1.122. The citric acid was precipitated from the washings, after acidulation, with acetic acid, with barium acetate and alcohol, the resulting barium citrate decomposed with sulphuric acid, and the citric acid calculated from the barium sulphate formed, 1.674 barium sulphate found equals, .788 citric acid.

From this is deducted the formula for bismuthous citrate, as follows:

Bismuthous oxide,	1.122	Or in other words,	1.170=1 equiv.
Citric acid, (anhydrous)	.788		.825=1 "
Water,	.086		.090=2 "
Loss,	.004		
Total,	2.000		2.085

Hence, $BiO_3, C_{12}H_5O_{11}+2HO$.

2.085 bismuthous citrate was cautiously treated with 100 *measures* ammonia, containing .26 ammonium oxide (NH_4O). "As the last drop constituting the 100 *measures* fell into the porcelain dish, the litmus paper, red until then, turned blue, and in the same time the liquid became perfectly clear."

This gives for normal ammonio-bismuthous citrate, the following formula:

$2NH_3, BiO_3. C_{12}H_5O_{11}+nHO$.

2.302 ammonio-bismuthous citrate, in scales, was treated with the same ammoniacal solution as before, 25 *measures* were necessary, which corresponds to half an equivalent. "The liquid was then decomposed with potassium hydrate in excess, and further treated as before, in the method for analyzing the simple citrate." The result was, bismuthous oxide 1.17, citric acid .823. The ammonia being already known, the compound is reconstructed, thus:

Bismuthous oxide,	1.170=1	equiv.
Citric acid,	.823=1	"
Ammonia,	.122=1½	"
Water,	.180=4	"
Loss,	.007	
Total,	2.302	

Or, in chemical symbols, thus:

$1\frac{1}{2}NH_3, BiO_3. C_{12}H_5O_{11}+4HO$."

By direct synthesis he finds that all the other bismuthous double citrates are analogous to the normal ammonium salt. That is, they contain to every equivalent bismuth or citric acid, 2 equivalents monad base. A most wonderful fact drawn from these investigations is that the citrates, with a fixed monad base, are remarkably stable in aqueous solution, whilst the ammonium salt, compared with them, is noted for its instability. He finds that the latter compound suffers complete decomposition within 24 hours.

Such revelations: when it is positively and generally known that double ammonio-citrates, as well as all the citrates in general, are perfectly stable in aqueous solution, providing this be duly concentrated.

Now for a closer acquaintance with his new-fangled analysis. It will be observed that in the first analysis, Creuse, for reasons best known to himself, piles up a second column, and from this, apparently, he derives the simple equivalent proportions. He also employs Dumas' equivalent number, 210, for bismuth, which is now generally abandoned, and Schneider's more accurate number, 208, used instead.

If we now divide any number in the second column, or the total sum, by any corresponding number in the first column, or its sum, we will find the constant ratio, which, applied to the second column, will reproduce the first. By dividing 2.085 by 2.00, we obtain that ratio in the term, 1.0425, all the other numbers similarly utilized, yield approximately the same result. But by inspection it becomes palpably apparent that the second column is not at all derived from the first, but *vice versa*. Because the first number in the second column, multiplied by 200, gives 234, or exactly the equivalent number for bismuthous oxide, as follows: $Bi=210, +(3O=24)=(BiO_3=234)$. The result for citric acid likewise multiplied by 200, gives 165, or exactly the equivalent number for anhydrous citric acid. The quantity denoting water, when multiplied by 200, gives 18, or twice the equivalent for water. How did Creuse arrive at this? Naturally enough he assumes that citric acid contains 3 equivalents basic water. He has noticed, from results obtained by reliable operators, as also in the peculiar analogy presented by the basic bismuth salts, that the citrate must, in all probability, contain one equivalent each acid and base. This fact established, he considers that, since the metallic base replaces one equivalent basic water in the acid, there must remain the other two still in combination.

Therefore, he presupposes the formula must be thus:

$$BiO_3\ C_{12}H_5O_{11}+2HO=417.$$

Had he regarded the fourth equivalent, water, representing merely hydration, as necessary, he would have put that in too, and the results would have tallied as easily for a compound represented thus:

$$BiO_3,\ C_{12}H_5O_{11}.\ 3HO.$$

Now 234 divided by 200=1.170,
165 divided by 200=.825, and
18 divided by 200=.09, their sum is 2.085, which is also equal to 417 divided by 200.

The first column, representing the quantities corresponding to 2 grammes, is now figured from this second column by the ratio above stated, or the quantities are found as follows, which is very likely the method employed by Creuse: 417 : 234 : : 2 : 1.122 ; 417 : 165 : : 2 : .788 (.791) ; 417 : 18 : : 2 : .086. These three results added together, plus the .004 which accumulates from the decimal, places beyond the third, and his slight arithmetical errors, makes up the intended 2 grammes. The barium sulphate is found thus :

417 : 349.5 : : 2 : 1.674 (1.676).

The second column, for this purpose, would be totally superfluous, but Creuse needs it as a screen to prevent the inquisitive public from peeping into the wizard's laboratory!

The next analysis is a veritable prophecy in itself. Creuse knows, as it were by instinct, that the imaginary compound $2NH_3$, $BiO_3. C_{12}H_5 O_{11}+n HO$, must contain 2 equivalents water in the simple citrate which he infers from the basic water in the citric acid. Therefore, .26 ammonium oxide is required, in some shape or other. This he naturally all premeditates, and hence, to appear in consonance with the metric system, he divides into 100 *measures.* (He has not come to cubic centimetres yet, but will next time.) These *measures*, however, have nothing in common with the analysis, for they may be drops or gallons as well, because all the ammonia must be added, consequently he might have spared himself the pains to add it cautiously, for the whole 100 measures *must* be poured in, as he needs the .26 ammonium oxide contained in them. It would be interesting to know, however, where that water is which should form ammonium base, when this is compounded in the salt, as the formula should evidently read.

$$2NH_4O, BiO_3 C_{12}H_5O_{11}+n HO.$$

But, presumably, he will find it among the nHO, but that would not reconcile his general formula.

$$2MO, BiO_3, C_{12}H_5O_{11}+n HO.$$

It is also strange that he did not begin with even grammes, but should take 2,085, which he figured on in the first analysis, very likely because his arithmetical chemical method was easier to accomplish, as the necessary data already existed, and saved the extra brain-work, which is precious in his case, since he affords so little that has any value, compared with the effort it apparently costs. Yet the last analysis is quite a big affair for a small thing.

2,302 (how nicely he always strikes it,) ammonio-bismuthous citrate in scales is treated with one hundred *measures*, containining .26 ammonium oxide, until the liquid is neutral, exactly 25 *measures* were added, corresponding to ½ an equivalent ammonia. Now, since .26 represents 2 equivalents ammonia, 1½ equivalents would be ¾ times .26=.195. But Creuse has it .122. This amazing hit shades all his previous glory into insignificance. This .122 multiplied by 200=24.4, and this divided by 26., the equivalent for ammonium oxide, shows that there would not quite be one equivalent ammonia in the salt. What a grave error Creuse's mathematics has again committed. Will any one dare to insinuate hereafter that figures don't lie? Creuse has shown them to be without exception, (not even himself,) the worst falsifiers on record, because it would not be civil to intimate that Creuse was either badly mistaken or *knowingly* false, we must, therefore, shove the unmitigated prevarication upon some imaginery scape-goat.

Substituting .195, the real value, in the column for ammonia, and adding it to the two preceding terms, we have 2.190, as the anhydrous material, subtracting this from 2.302, the whole amount he pretended to have started with, then .112 remains, multiplying this by 200, and dividing by 9, the water's equivalent, we receive 2½ as quotient. Consequently, if all else was correct, the compound must be thus:

$$1\tfrac{1}{2}NH_4O,\ BiO_3\ C_{12}H_5O_{11}\ 2\tfrac{1}{2}HO.$$

But, properly,

$$3NH_4O,\ 2BiO_3\ 2(C_{12}H_5O_{12})\ 5HO.$$

Is not this elegant? He undoubtedly endeavored to calculate the whole job from Bartlett's analysis, and took the formula

$$NH_4O,\ BiO_3,\ C_{12}H_5O_{11}\ 5HO$$

as a basis, considered one equivalent water equal to ½ an equivalent ammonia gas, and then commenced to figure with the above encouraging success, and then how modestly that loss came in precisely .007. Beautiful botch!

Now, this is all well enough for Creuse, because he can only be inconsistent or nothing. But how much respect must the intelligent readers lose for an editor who greedily publishes such unadulterated bosh.

The *Physician and Pharmacist*, for November, 1871, being so long on the road caused serious apprehension that perhaps the lively circular was no more. At last it came, like the prodigal son. The editor had been seriously ill (which editor?). What a plausible pretext for a profitable delay the editor's illness makes. It might have been surmised that the pharmaceutical editor had completely lost his head over those brain befuddeling mathematical problems—not any — revolutionary movements in this line will ever decapitate him, *a la guillotine*, (metaphorically,) or effectually demoralize him in any other way, for, like his prototype, the village pedagogue, "though even vanquished, he can argue still." That machine was in all probability stopped by the pharmaceutical editor, who was busily engaged plagiarizing (easy on him) Rother's article on Phosphates, which had just appeared in THE PHARMACIST, August, 1871. Such instances also show the unrivaled advantages quarterlies have, when they are late. The August number can be issued in November, and contain all the desirable matter from other sources, original by the editor, notwithstanding the priority in fact derived from its earlier issue in other publications.

The *Physician and Pharmacist*, for November, 1871, contained a paper on soluble iron phosphates, by Creuse, representing to be a continuation to the paper on citric acid in the August number. There was, however, no connection between the two papers any more than that the name ferric phosphate was only casually mentioned in the first one at the close.

Creuse now proceeds to explain that the soluble ferric phosphates are perhaps the most important among his *newly* discovered *quadruple citrates.* According to him, the ordinary precipitated ferric orthophosphate only has the capacity for forming such combinations. "He found its composition to be $Fe_2O_3\ PO_5$ when heated to redness; $Fe_2O_3\ PO_5 + 4HO$, when dried at 212°, and $Fe_2O_3\ PO_5 + 10HO$ when simply dried in open air." Yes, there is no doubt whatever that he *found* the composition as stated. But it was effected by looking the matter up in some book. From what is already known in regard to his achievements, such assertions are decidedly stale.

In the process for precipitating the ferric phosphate he says the sodium phosphate is taken in excess, only with the intention to form a light precipitate more easily soluble in ammonium citrate than when the sodium phosphate is only used in equivalent proportion.

He apparently does not even understand yet that when equivalent proportions are used there will be free sulphuric acid in the liquid, which dissolves the ferric phosphate to some extent. But when the sodium phosphate is employed in excess there will only be free phosphoric acid, in which the ferric phosphate is *insoluble.*

That he is totally ignorant on this point is evident, because, in alluding to a *ferric superphosphate* he states that in his knowledge phosphoric acid is the best solvent for ferric orthophosphate. This absurdly mistaken idea he imbibed at the source where he found the composition for ferric phosphate in the hydrated and dehydrated state, by supposing that there exists but one ferric orthophosphate. Had he not been so superciliously wise just then, he might have learned something—namely, that there are a number such phosphates, and that the ferric sesqui phosphate $2Fe_2O_3.\ 3HO\ 3PO_5$ is the salt which dissolves readily in phosphoric acid, but not the phosphate $Fe_2O_3PO_5 + 8HO$, which is ordinarily obtained.

E. Heydenreich, among the first, proposed and investigated the combination formed by dissolving ferric orthophosphate in ammonium-citrate. (*Am. Jour. Pharmacy,* July, 1861.)

In the *American Journal Pharmacy,* Dec., 1871, Creuse takes it seriously to heart, and H. Kaemmerer rigorously to task for having stolen his (Creuse's) thunder on the citric acid question, as he had previously gone over the *whole* ground himself. Yet would not Creuse feel specially unhappy if he should be informed that Kaemmerer's celebrated essay on the citrates (not the quadruple kind) dates from 1868, and that the miserably patched-up fragment, floating the rounds in the pharmacal journals, is like the lone meteor, strayed from the brilliant constellation whence it had its source? and would not his refined sensibilities receive an additional shock to know that Heldt, long before Kaemmerer, had precipitated the amorphous tri-metallic barium citrate, with barium acetate and alcohol?

This citrate $Ba_3''\ (C_6H_5O_7)_2\ 7H_2O$, "When precipitated in the cold, dissolves in water; but when it has been precipitated from a hot solution it is nearly or quite insoluble in water."—(Liebig.)

Sodium citrate solutions dissolve it in the cold.—(Heldt, Spiller.)

Kaemmerer found that the amorphous barium citrate, when heated, for several hours, with much water, became utterly insoluble and crystalline. It had lost two molecules water, and the new compound which remained had the composition—

$Ba_3'' (C_6H_5O_7)_2 5H_2O.$

If this salt be again repeatedly heated with much more water, for a longer time, it further dehydrates and takes another very characteristic crystalline form. This second salt is absolutely insoluble in water, has an invariably constant composition, and the formula—

$Ba_6'' (C_6H_5O_7)_4 7H_2O.$

The *Physician and Pharmacist* having fallen ignominiously defunct from his hands, Creuse now pours his literary dish water into other channels. His *chef-d'œuvre* was recently heralded with a tremendous fanfaronade, and the irresistible blast even struck the PHARMACIST foul. Now since the harping still continues on the same string, it was found that time, labor and space would be greatly economized by going through the whole conglomeration in a heap, rather than picking up the itinerant trash piecemeal. The all-absorbing interest centres about that *newly discovered* ferric iodide quadruple citrate, the brightest gem in his literary coronet. It was no sooner found than patented, then indefatigably advertised as the *tasteless* and *colorless* (comparatively,) ferric iodide, and finally divulged as the ferric iodide potassium quadruple citrate, at the annual alumni meeting in the New York College, the paper being published in the annual alumni report for 1873, and from this voraciously transcribed into nearly all the pharmacal journals.

Another rehash was afterwards published in the *American Journal Pharmacy*, June, 1873. Then a faint allusion appeared under the note and query column in the *Druggists' Circular*, July, 1873, where Creuse himself evidently spoke through the editorial quill, and lastly occurred the unanswerable *coup d'main* in the PHARMACIST for August, 1873. The salient point which Creuse attempts to maintain in favoring the ferric salts for therapeutical uses is their supposed medicinal superiority, which he infers from his belief that triad iron is normal to the animal organism. He asserts this so unremittingly and with such emphasis, as though his simple affirmation had established the fact that only triad iron pervades the economy, and as though it were now accepted as a physiological axiom.

Yet it was never known that this was the actual case, but to the contrary it *is* an important physiological *fact* that only diad iron exists in the circulation.

Creuse, moreover, says that iron always is and properly should be administered before a meal. This is fundamentally wrong. It is a therapeutical maxim that iron should be given after meals. He "explains also why ferrous iodide is best administered just before a meal, for the food supplies the stomach with both the oxygen and the vegetable salts necessary for digesting the ferrous compound."

In referring to certain points "which cannot be easily controverted," and on which he re*lies* to prove the medicinal superiority attaching to *his new* compounds, he states that because triad iron is normal to the human system, Mr. Rother had said the sesquisalts should be preferred to the protosalts whenever iron is indicated.

There is so much iron–y in that point that it must surely be impregnable—such incontrovertible proofs. Yes, they know *piles* about it; the question is very pertinent, Were those phrenological knobs riveted on?

The writer will now complacently pour a little cold water on that fervor, and conclusively show—Creuse generously helping to annihilate himself—that the diad form is preëminently *the* proper condition in which to administer iron, when conjoined to iodine. Creuse admits that *his* new ferric iodide potassium, or any other monad–*ium* quadruple citrate, is easily decomposed by the stronger acids (a bad feature to recommend it), regenerating free *ferric iodide* again. Now it is another physiological axiom that free chlorhydric acid is always present in the stomach during healthy digestion, when the *ferric iodide potassium quadruple citrate* comes in contact with chlorhydric acid ferric iodide and citric acid are liberated, and potassium chloride is formed. The *ferric iodide* uncombined equals ferrous iodide and free iodine, which latter is most easily separated from the first in numerous ways as the writer had shown in his paper on Ferric Iodide, in the PHARMACIST for July, 1873. But human food is largely supplied with starchy material; therefore the surplus iodine is instantly absorbed by the starch forming the characteristic blue compound, whilst the ferrous iodide remains to be directly seized upon by the absorbents. Creuse, how does your theory on assimilation come up with this?

It is fair to infer that Creuse's treatment in this case is wasteful and calculated to help the producer more than the patient.

Furthermore, Creuse asserts that the oxygen in one case prepares, and in the other preserves, the iron in the triad state for the assimilative process.

The best antidote against such nonsensical notions are Richard Phillips, Jr.'s, researches on iron in soils, published in the British *Pharmaceutical Journal*, May, 1845. Phillips found that the most fertile surface soils, and therefore the richest in organic matters, always contained much iron, and *invariably* in the *diad* state. He proved, by direct experiment, that air forced through the earth had no action whatever on the iron, whilst the carbonaceous material was sensibly oxidized and converted into carbonic acid.

He found that the iron in the bog earths existed partially in a soluble form, probably combined with carbonic acid, as acid carbonate. An uncombined peculiar organic acid, supposed to be the suberic, but perhaps one peculiar to the soil, was always present, and an organic acid, in combination with calcium in the neutral fertile soils was never absent. He also ascertained that the deep clay frequently contained iron sulphide. This earth, after exposure to the air, was decomposed, the iron passing into the triad state by oxidation. He found that poor soils, free from humous matter, contained only triad iron.

These results, by analogy, firmly establish the fact that only diad iron can and must be assimilated by the organism direct, the decomposing organic matter preventing its oxidation.

Creuse promulgates that only polybasic acids can generate his *new* quadruple salts, but he prominently mentions lactates. Now, since when is lactic acid no longer monobasic, and how unjust that he should exclude the unpretentious acetic acid from the list, when this really alleviates the free iodine equally as well. Furthermore, acetic acid possesses the tendency to form both acid and basic salts, a fact which should entitle it to more consideration than he allots it.

But his belief is unbounded, for, with very little or no effort he will, after several repetitions, actually swallow and digest the most improbable effects he ever invented.

That elegant theory on those quadruple salts is an artistic achievement. Because ferric salts react acid on litmus, and the normal monad citrates are neutral, consequently ferric salts can perform the acid functions, whilst the citrate plays the base. How truly *en rapport* this is with modern chemistry, or any other chemistry.

Does he mean to insinuate that ferrous salts react neutral on litmus. Now, since their reaction is decidedly sour on litmus, why can the ferrous salts not form quadruple citrates as well? And sure they can, for when ammonium citrate, or some other monad citrate, is added to ferrous salts, soluble or insoluble, the green solution is obtained in which the metallic flavor is greatly relieved. This property has long been analytically applied, since citric acid, tartaric acid, etc., and other non-volatile organic bodies prevent diad, as well as triad iron, from being precipitated when free alkali is present. This property was also suggested quite a time ago, for preserving ferrous iodide with ammonium citrate.

In February, 1864, H. N. Draper published an article in the British *Pharmaceutical Journal*, on metallic oxides, soluble in ammonium citrate, wherein he details the behavior these solutions exhibit with numerous reagents. He found that potassium citrate was comparatively a weak solvent, whilst the ammonium and sodium citrates were admirable solvents. In the same journal, for August, 1864, he describes and proposes a method for preparing a permanent Vinum Ferri, by using the ordinary ammonio-ferric citrate, in conjunction with ammonium citrate. Since then the ordinary and somewhat difficultly soluble simple citrates have been commercially supplanted by double citrates, containing monad citrate in excess. These compounds were distinguished from the other salts by their exceeding solubility and greenish color. The soluble quinia-ferric citrate, with its light green color and extreme tendency to deliquesce, may be cited as a familiar example.

Creuse also flings odium upon the ferrous salts, for their instability, and very intractable nature, saying that nothing can be formed with them, not even an alum. What advantage there would be in alum we leave for Creuse to determine. But it is known that the ferrous salts are prolific in their combinations with other salts. Take, for instance, the very stable compound the ferrous sulphate forms with ammonium sulphate, so much used by photographers and analytical chemists, then the unchangeable ferrous oxalate, then again the ferrous salts are in themselves most remarkably stable compounds; prolonged boiling does not change them. Ferrous oxide is a powerful base, and if oxygen and other dehydrogenating agents are excluded, the ferrous compounds will not, on their own account, from internal instability, pass into the triad state. Now, ferric oxide is a weak base, when its normal salts are boiled they are easily decomposed into free acid and oxysalts. The ferric alums are so unstable that contact with water instantly decomposes them; when exposed to direct sunlight the ferric salts, are reduced to the ferrous state. Sulphydric acid reduces them to the ferrous condition, and ammonium sulphide only precipitates ferrous sulphide from the ferric salts. Triad iron is not normal to the human organism; vital agency or decomposing organic matter must first reduce it to the diad state before assimilation can take place.

Creuse says ('tis well he only says it,) that a basic ferric citrate does not exist. However, it is well known that ferric citrate forms analogously basic salts to the chloride, nitrate, sulphate, etc. The first two are destroyed by heat forming insoluble oxysalts, whilst the basic or oxysulphates are soluble, consequently heat does not destroy the officinal subsulphate. Wittstein and others have described and investigated the oxycitrates, and in THE PHARMACIST, for September, 1870, C. Lewis Diehl again emphasized the fact that the normal citrate absorbs additional oxide, precipitable by heat.

In reference to ferric iodide, Creuse states that one equivalent metallic iron, one and a half equivalents iodine (189.3 grains,) and one equivalent (201 grains) citric acid saturated with 3 equivalents alkali will coalesce to a perfect union, thus:

$$Fe_2I_3 + 2(3KO.C_{12}H_5O_{11}) \text{ old notation.}$$
$$Fe_2I_6 + 4(C_6H_5K_3O_7) \text{ new notation.}$$

Continuing, he says the proportion,

$$Fe_2I_6 + 2(C_6H_5K_3O_7)$$

is incorrect. As this means that 768 grains iodine combined as ferric iodide will completely unite with 420 grains citric acid ($C_6H_{10}O_8$) saturated with potassa. Because 840 grains citric acid can only effect the transformation, and not a grain less. What astonishing precision this is again; firstly, the proportion is iodine 757.2 grains, to citric acid 804 grains, and then 768 iodine to 840 acid, when the real proportion would be 762 iodine and 804 citric acid.

But Creuse prescribes that the 840 grains, to be saturated with potassa, must be the acid, $C_6H_8O_7.OH_2$. Now it is highly presumable that Creuse, knowing so little about chemical notion generally, but the new notion particularly, does not comprehend that this indicates citric acid in a crystalline form, which rarely occurs, it being the acid which separates from a saturated solution in the cold. The ordinary or commercial citric acid is obtained by crystallization from the hot solution, and its composition is $2(C_6H_8O_7)\ OH_2$. It would make some difference indeed to use one for the other. But Creuse no doubt is fully able to reconcile such slight discrepancies when he laborates.

Creuse does also not understand the writer's equation denoting the change when an acetate is added to the iodized iron solution. It is not expected, from what has been seen regarding Creuse's capabilities in such matters, that he would. He imagines because ferric acetate is red and not green, that there is no rearrangement in the elements brought together there. Red and green being complementary colors, perhaps *he* might have seen even the green playing about the edges, had he gazed intently for a moment. He has often seen more improbable things than the illusion excited by the sudden transition from something to nothing, or *vice versa.*

Heinrich Rose discovered that citric acid added to ferric chloride prevented the precipitation, by alkalis. He also found that ferric citrate, slowly soluble in water, readily dissolved when an alkaline citrate was present. This discovery was soon applied to the other iron salts, with equal success, and the method was incorporated into the general analytical processes, when iron, aluminium, etc., was to be held in an alkaline solution. Rose had discovered that sodium pyrophosphate in excess, readily dissolved the ferric pyrophosphate, and the combination was then medicinally employed. Afterwards Robiquet applied Rose's discovery with alkaline citrates to the ferric pyrophosphate.

When sufficient ammonium citrate is added to the ferric citrate, the red color is discharged, and the writer has found, by direct experiment, that the red color completely disappears when one equivalent ammonium citrate has been added for each equivalent ferric citrate, forming the green double salt, thus:

$$Fe'''(C_6H_5O_7)+C_6H_5(NH_4)_3O_7=Fe'''(NH_4)_3\ 2(C_6H_5O_7)$$

Ferric citrate is insoluble in strong alcohol (Heldt). Normal ammonium and normal potassium citrate are nearly insoluble in strong alcohol, (Heldt.) When a strong ammonium citrate solution is mixed with strong alcohol, the citrate separates in oily drops, absorbing the water, and dehydrating the alcohol. Now the writer has found that when the brownish red magma, produced by adding strong alcohol to a strong ferric citrate solution, is treated with a concentrated ammonium citrate solution, the ferric citrate is completely absorbed by the ammonium salt, and the combination subsides in greenish oily drops; when the ammonium citrate is used in large excess the supernatant alcohol is colorless and free from iron, but when the ammonium salt is only present in equivalent proportion, the alcohol dissolves the double salt almost perfectly, to a light green solution

The double phyrophosphate salt is analogous to this citrate, because the material used in its construction is in the proportion to form the compound, thus:

$$Fe'''_4\ 3(P_2O_7)+4(C_6H_5(NH_4)_3O_7)=Fe'''_4\ (NH_4)_{12}.\ (P_2O_7)_3(C_6H_5O_7)_4$$

Or,

$$4(Fe'''(C_6H_5O_7))+3((NH_4)_4.P_2O_7)$$

and the orthophosphate salt thus:

$$Fe'''PO_4+C_6H_5(NH_4)_3O_7,$$

However, in practice, less citrate seems to answer than this formula indicates. When the above described green double ammonium and iron citrate is treated with ammonia in excess, the salt is decomposed, and the brownish red officinal ammonio-ferric citrate and normal ammonium citrate is produced thus:

$$3(Fe''' \, (NH_4)_3 \, 2(C_6H_5O_7)) + 3(NH_4O) = \\ Fe'''(NH_4)_3 \, 3(C_6H_5O_7) \; Fe_2O_3 + 3(C_6H_5(NH_4)_3O_7).$$

When Creuse's ferric iodide quadruple citrate is treated with potassium hydrate the liquid beomes brownish-red, and if the hydrate is added in excess, ferric hydrate is precipitated.

The equation,

$$Fe_2I_6 + 2(C_6H_5K_3O_7) = 6KI + 2(Fe'''.C_6H_5O_7)$$

is based on the analogy presented by the two phosphatic double salts; and is thus far consistent and correct, as would be required to show the decomposition between the two original compounds which are mixed. But citric acid, being a strong acid, will only exchange when the decomposition product is removed as rapidly as it is formed. This is accomplished by alkaline citrate in excess, by which the complete and final result is effected, thus:

$$Fe_2I_6 + 4(C_6H_5K_3O_7) = 6KI + 2(Fe'''(NH_4)_3.(C_6H_5O_7)2).$$

It even astonished the writer to witness the reckless alacrity with which Creuse rushed into the trap in his hasty effort to make a *hit*.

100 grains iodine was mixed with 4 fluid ounces water and treated with metallic iron until the iodine had all combined, the clear solution was removed from the surplus iron, 50 grains more iodine added, and after solution being perfect, the liquid was divided into two equal parts, each representing 75 grains iodine in the form Fe_2I_6. 158.3 grains citric acid dissolved in 2 fluid ounces water was mixed with 236.5 grains crystallized monopotassic carbonate, calculated as follows:

$$I_6 : 2(2(C_6H_8O_7).OH_2) :: 762 : 804 :: 150 : 158.3.$$

$$I_6 : 12(KHCO_3) :: 762 : 1201.32 :: 150 : 236.5.$$

The citrate solution was then gradually poured into one-half the iron solution, representing 75 grains iodine. One-half this was needed to combine all the iodine, but all the citrate solution was added for the purpose which will presently become apparent. The green liquid was then carefully evaporated, so that the pasty residue became solid on cooling. The product was light green, granular in appearance, and highly deliquescent.

As inferred from the equation, this should not be a homogeneous salt, but a mixture containing potassium iodide and the green double potassio-ferric citrate, containing potassium citrate in excess. Now, as the writer had found that the alkaline citrate in excess prevents the iron compound from being dissolved by the alcohol, it was assumed that the surplus citrate here would have that effect, consequently, potassium iodide, if present, alone would pass into the alcoholic solution.

The residue was, therefore, treated with strong alcohol, after moderate or prolonged digestion, the alcohol remained perfectly colorless; it was poured off from the pasty residue, strongly acidulated with chlorhydric acid, and tested for iron with potassium ferro-cyanide and potassic sulpho-cyanate, yielding negative reactions. To be positive, however, as to absolute freedom from iron, a very dilute liquid was dropped in, containing only a ferric trace, when the two portions tested gave the very characteristic deep blue and dark red reactions at once. This established the fact that no iron was dissolved in the alcoholic solution.

The alcoholic liquid was now tested for iodine. Plumbic acetate was added, when the characteristic yellow plumbic iodide was profusely precipitated. This reaction established the fact that iodine was even largely present, without a doubt. Mercuric chloride was then added, which resulted in a copious *white* precipitate, which slowly subsided on standing, but on heating the liquid the precipitate rapidly subsided in heavy curds. The same result was experienced by first largely diluting the alcoholic solution with water. Continued heat applied to the liquid for a few moments began to deepen the color, the precipitate becoming more and more compact and granular, till at last the ordinary red mercuric iodide remained. The transformation was infinitely more rapid by pouring off the first liquid and heating the precipitate with pure water. The white precipitate readily dissolved when either the mercuric chloride or the alcoholic liquid was used in excess. However, the remarkable fact was elicited that it also readily *dissolved* in dilute chlorhydric acid, and in which solution ammonia, even in great excess, gave no precipitate or coloration whatever, but when potassium hydrate was added, either to the acid or ammoniacal solution, a brownish-red precipitate immediately formed. The precipitate, when once changed to final red, was, however, absolutely insoluble in chlorhydric acid.

To have undoubted assurance that the abundant white precipitate was really an iodide, it was dissolved in dilute chlorhydric acid, and the solution gently warmed with manganese dioxide, the iodine odor became at once strongly perceptible; after cooling, chloroform was poured into the mixture, and to separate the manganese dioxide which obscured the solution, alcohol was poured in, the oxide then rapidly settled, and when the brownish-red alcoholic liquid was decanted and poured into water, the chloroform holding the iodine in solution separated in violet colored drops. This left no suspicion whatever as to the true character possessed by the precipitate. It is a peculiar mercuric iodide heretofore undescribed. The writer is now investigating this novel body as to its constitution and molecular composition. The effect is probably due to the octaedral form into which the alcohol had converted the potassic-iodide, because potassium iodide dissolved in alcohol gives the same precipitate with mercuric chloride.

The green deliquescent residue, after being analytically examined, was subjected to microscopic inspection. The field presented a uniform granular mass, constantly in motion, owing to the strong hygroscopic tendency. The residue was, therefore, treated with alcohol, but the granular character, at times appearing to have some indistinct crystalline semblance, remained utterly unchanged, but the alcoholic liquid, as it evaporated, yielded most magnificent crystals in great plenty, the crystals were at once recognized as potassium iodide, crystallized uniformly in beautiful octaedrons, which is a very rare form for this salt to assume.

The writer, with these results, has conclusively shown that Creuse's ferric-iodide quadruple citrate is a myth, and that the mixture is nothing more than potassium iodide and green ammonio-ferric citrate. Would it not be advisable for Uncle Sam to employ some competent chemist in his Patent-Office Department who could judge in an unbiased and indubitable manner, when a shyster attempts to impose on him and his constituents?

In the *Druggist's Circular*, for July, 1873, under "Notes and Queries," appears a *query* how to mix equal parts tincture ferric chloride, diluted phosphoric acid, Hall's solution strychnia and simple syrup, so that no precipitate shall form. The editor's friend, with *extensive* laboratory facilities, "rises to explain ". that, by adding more acid the precipitate increases, but after adding still more acid, the precipitate re-dissolves, and the solution then contains *ferric* superphosphate. But to remedy the evil effectually, he proposes to add potassium citrate until the precipitate is re-dissolved.

Now, firstly, there is no precipitate formed when these ingredients are mixed. The only occasion on which a precipitate could form here would be when the glacial phosphoric acid was preponderatingly adulterated with sodium phosphate, from which the diluted acid was prepared. The writer made the mixture several times in the proportions indicated, each time changing the order in mixing the ingredients, but all the results were identical. One mixture, which had an excess phosphoric acid added to it, began to deposit a white granular sediment, about 5 or 6 days after mixing, which gradually increased; after no more precipitate separated, the residue was treated with much diluted phosphoric acid, but this did not diminish the quantity, even on long standing. The phosphoric acid in the original mixture removes the yellow color mostly, but by adding half as much more the liquid becomes perfectly colorless. If this solution be now most excessively diluted with water, the liquid becomes milky.

In the *Druggist's Circular*, for August, 1873, under "Notes and Queries," the question is put how to make ferric chloride, mixed with quinine sulphate, palatable. Some officious individual answers, "add potassium-citrate and comp. elixir taraxacum."

Now such extensive tampering with a physician's prescriptions would be outright criminal. Furthermore, what an elegant combination that would produce. When liquorice is added to quinine in order to conceal the bitterness to some extent, the desired result is only obtained by precipitating the quinia in a very insoluble combination with the glycyrrhizin. If the mixture is strongly acidified, the quinia remains in solution, and the taste is unrelieved. Besides, it is perfectly disgraceful for intelligent physicians to use such an ante-diluvian empyrical curiosity as the comp. elixir taraxacum, although it was recently invented, undoubtedly under great pains. However, the above delectable mushes, believed by their inventors to be the signs in advancing pharmacy, are fully worthy the *cuisiniers* who contrived them. If no one but their originators will have to swallow such a *multum in parvo* no special harm will result. *Vous l'avez voulu, monsieur* Creuse, *vous l'avez voulu.*

A FEW WORDS ON GUAIACI LIGNUM OF COMMERCE.

BY J. H. SCHULZ.

The raspings, trimmings, and shavings of guaiacum wood, also called "Lignum Vitæ," are employed by pharmacists for medicinal and pharmaceutical purposes. It is said to contain 26 per cent. of resin, to which the medicinal virtues of the wood may be attributed. The writer has been unable of late to obtain the *true* trimmings of this wood through commercial sources, he holds samples from ten different jobbing-houses which were sold as true guaiac wood, but all of which bear due evidence of being entirely deprived of its resin. It seem as though the *true* trimmings of this ligneous drug were altogether withdrawn from the market at present, yet an abundant supply of a totally worthless substance may be found at any wholesale druggist's, which the latter are always ready to palm off to an inattentive pharmacist as guaiac raspings, but which prove to be entirely destitute of its natural resinous susbtance, having been subjected to previous extraction. This substance is, consequently, inert, and should be rejected by all conscientious pharmacists, so as to relieve the market of the rubbish.

As a general rule the jobbers and wholesale druggists will be brought into requisition to bear the greatest degree of censure at the hands of the profession in disposing of this waste and refuse as a medicinal drug, yet, in our opinion, the vendee of such trumpery, who, with a sense of satisfaction, entertains the presumptuous idea of having purchased a lot guaiacum at a bargain, is equally culpable as an abettor in this act of villany, as he defeats the expectations of his customers by substituting a spurious and fallacious drug, in addition to exhibiting an unusual amount of self-delusion in the extra pecuniary gain.

Inferior goods will be produced as long as the demand for them continues; it should be the endeavor of every pharmacist to add his mite to improve the condition of our drug market by exhibiting more care and vigilance in the selection of his stock; no effort should be spared on his part which would in any manner be beneficial in accomplishing this honorable and humane object. Unfortunately, we must admit that a large number of our vendors of "Drugs and Medicines" do not possess the capability of passing a correct judgment on the quality of goods they purchase; their inexperience and partial ignorance of a knowledge of pharmacology will suffer them to remain the victims of unscrupulous sophisticators in drugs and medicines.

Not very unfrequently we notice "young lads," who have scarcely passed their rudimentary stages of apprenticeship in pharmacy, impressed with the imaginary idea of possessing all proper capabilities required in conducting the business of pharmacy on their own responsibilities, which project is also frequently carried into effect. Their scientific intelligence, however, will soon after illustrate itself by scarcely reaching beyond the limits of selling "*Hamburg Drops* and *Vinegar Bitters.*"

These "patent-medicine druggists" will certainly not assist to improve the present condition of our drug market, as the "Almighty dollar" is one of the highest objects they crave for. Being incompetent to *judge* and *select* good, or *reject* inferior drugs or medicines, they will remain entirely at the mercy of the wholesale druggists, and accept whatever the latter will feel inclined to send them in filling their orders.

[With this paper we received from the author eleven specimens of guaiacum wood, bearing the addresses of leading wholesale drug houses in New York, Philadelphia, Chicago, and Milwaukee. These specimens, with the exception of one hailing from Milwaukee, were found, on examination, devoid of resin, and when subjected to the fumes of nitrous acid or the corrosive sublimate test, the reaction so characteristic of true guaiacum wood, was not obtained. The question arises, What is this article of the market? Is it some other wood, or has the resin been extracted by some cheap solvent?—EDITOR.]

ADULTERATED LYCOPODIUM.

BY BENJ. LILLARD, NASHVILLE.

My attention being called to the peculiar appearance of some pills that had been placed in Lycopodium, to dry, it having adhered in irregular masses, and being unable to account for such a result, I made an examination of the Lycopodium, which had been recently received from a jobbing house in New York I found it to be of a lighter color, and upon exposure for twenty-four hours in a shallow box, as had been with that on the pills, it lost much of its mobility, and readily adhered in lumps. Upon rubbing a small quantity in a mortar with water, the peculiar odor of Dextrin was recognized. A further examination, by washing thoroughly with water, and drying, the residue showed that it had been mixed in about equal parts.

Dextrin is well adapted to adulterate Lycopodium, and a mixture of equal parts, if slightly colored, possesses the general characteristics of the pure article, and would ordinarily pass unnoticed, except that if exposed in a damp place, it is apt to attract moisture, and adhere loosely. Dextrin, even when mixed in small proportions, is very easily detected, by rubbing in a mortar, with a little water, when its peculiar odor is at once developed and recognized. I have since examined a number of samples, from different places, but have been unable to detect any Dextrin in any of them.

AMERICAN PHARMACEUTICAL ASSOCIATION.

NOTICE OF ANNUAL MEETING.

The twenty-first annual meeting of the American Pharmaceutical Association will convene at Virginia Hall, in the City of Richmond, Va., on the 16th day of September (third Tuesday), 1873. As this will be the first meeting held in the Southern States, it is earnestly desired that the different sections of our country may be fully represented, and thereby give evidence of its national character, and of a continued and growing interest in the Association. The city of Richmond is easy of access from all parts of the Union, and presents, with its vicinity, much of historic interest. An excursion to Petersburg, Fredericksburg and Mount Vernon is in contemplation. Details relating to the excursion, and to the hotel accommodations for the visiting members, will be shortly announced by the Secretary. Pharmacists and others eligible for membership are invited to forward or present their names for election, and thereby aid in extending the usefulness of this Association. The necessary blanks can be otained from the Permanent Secretary, Prof. John M. Maisch, 145 North Tenth Street, Philadelphia, Pa.

The exhibition of objects relating to Pharmacy and the collateral sciences has become a prominent and interesting feature of our annual meetings, and we hereby extend a cordial invitation to all who may have apparatus and specimens of interest, either of their own manufacture or of others, to send them, *prepaid*, addressed to the American Pharmaceutical Association, at Virginia Hall, Richmond, Va.

ALBERT E. EBERT, *President.*

The 21st annual meeting will convene in the Virginia Opera House (formerly Virginia Hall,) in the city of Richmond, Va., on Tuesday, September 16th, at 3 o'clock P.M. Ample accommodations have been secured at the Exchange Hotel and Ballard House. The traveling arrangements are as follows:

The Eastern Members will leave Baltimore on September 13th, at 4 oclock P.M., by boat for Fort Monroe or Vue de l'Eau, where they will spend Sunday, and arrive in Richmond on Monday at 5 P.M., *via* James River. Members intending to join will notify in advance Mr. J. F. Hancock, corner Baltimore and Caroline Streets, Baltimore, stating number of berths and time of arrival.

Excursion tickets for the trip *from Baltimore* by Bay Line and James River steamers to Richmond, and thence, *via* Fredericksburg, *to Washington*, will be sold on the steamer on Saturday, September 13, and Monday, September 15, at $11. Round-trip tickets, over the route as proposed above, are issued from and back to New York at excursion rates ($22.30).

In all cases where baggage can be checked only to Baltimore it will be transferred free of charge to the boat, by the agent of the Bay Line, or by the Union Transfer Co., as special arrangements will be made on the boat for the greater comfort of the excursionists.

The Western Members will leave Cincinnati on Friday, September 12th, at 4 P.M., by steamer for Huntington, spend Sunday at White Sulphur Springs, and arrive at Richmond on Monday evening. Fare, $17.00; return passes good for 2 weeks free upon presenting Certificate from undersigned. Members will report in advance to Prof. J. F. Judge, Court and Cutter Streets, Cincinnati.

Goods for Exhibition should reach Richmond by Monday, freight prepaid. Members intending to join the projected Excursions to Petersburg and to Mount Vernon, will report in Richmond to the Secretary.

Applications for Membership should be addressed to the Permanent Secretary,

JOHN M. MAISCH, Phar. D.,
145 North Tenth St., Philadelphia.

COLLEGES OF PHARMACY.

CALIFORNIA COLLEGE OF PHARMACY.

The first annual prospectus of this school has come to hand, in which is announced the affiliation of this pharmacal school with the University of California, of which it is to form one of the group of technical schools to be established by this State. The following is the form of agreement:

"In accordance with the Organic Act of the University of California, the California College of Pharmacy is hereby affiliated with the University, upon the following basis:

"The College will maintain its own Board of Trustees, and will continue to hold its own property as if this affiliation had not been agreed upon.

"The College will also appoint its own professors, and establish its own course of instruction, subject to the general approbation of the Regents of the University.

"The University will confer the degree of Graduate in Pharmacy upon candidates recommended by the Board of Examiners of the College, and approved by a committee to be designated by the Regents.

"This agreement may be canceled by mutual consent, at any time, or by the withdrawal of either party to it, after twelve months' notice to the other party."

The double course of instruction (a junior and a senior course,) has been adopted by this school. The faculty of the college is composed of *actual* pharmacists, which feature is highly commendable to some of our colleges east of the Rocky Mountains, who have yet to be impressed with the inaptness of practising physicians as *practical* teachers in any of the branches of our pharmacal curriculum. What our students want are lectures adapted to the science of pharmacy, and not that of medicine, and certainly no physician who has had only a theoretical training, can apply this knowledge in any of the branches of chemistry, pharmacy, and materia medica. The lectures should be not only chemistry, but pharmacal chemistry; not only botany, but pharmacal botany, and not only materia medica, but pharmacognosy. This is our idea of a pharmacal course of instruction, and this imparted to the student by actual pharmacists.

The faculty are: Willard B. Rising, professor of chemistry; J. Winchell Forbes, professor of pharmacy; Wm. M. Searby, professor of materia medica; Herman H. Behr, M.D., professor of botany. The lectures commenced July 11th, 1873, and will terminate about the middle of

December. The officers of this college are: Wm. T. Wenzell, President: John Calvert, Vice-President; J. Winchell Forbes, Secretary, and James G. Steele, Treasurer.

CINCINNATI COLLEGE OF PHARMACY.

The third session of this school will commence on October 8th, 1873, and terminate about the second Wednesday in March, 1874, giving a full five months' course. The faculty are: Edward S. Wayne, M.D., professor of materia medica and botany; J. F. Judge, M.D., prof. of chemistry; W. B. Chapman, M.D., professor of pharmacy. The officers of this college are: J. F. Judge, President; F. L. Eaton, Recording Secretary; E. S. Wayne, Corresponding Secretary, and W. H. Negley, Treasurer.

MARYLAND COLLEGE OF PHARMACY.

At the stated meeting, held on the 10th of July, the semi-annual election of officers resulted in the election of John F. Hancock, President, Edwin Eareckson, Secretary, and J. Brown Baxley, Treasurer.

ST. CLAIR PHARMACEUTICAL ASSOCIATION, OF SOUTHERN ILLINOIS.

The following, which we copy from the *American Journal of Pharmacy*, for August, will, no doubt, be news for some who reside in the State of Illinois and its vicinity, as it has been to us:

"We acknowledge the receipt of a copy of the Statutes of this Association, which was organized April 23d last, and incorporated May 20th. The following is stated to be the *object of the Association:*

"'The object of this Association shall be to unite all Practical Pharmaceutists of Southern Illinois for the purpose of promoting the interest, the development, the welfare and progress of the Pharmaceutical Science and Art, and also of improving, elevating and protecting our professional standing in public life. It shall be furthermore the future aim of this Association to erect a School of Pharmacy for the Southern part of this State, at the City of Belleville, as soon as possible and practicable, in order to educate therein theoretically and practically studied Pharmaceutists, so that our worthy profession may derive honor, and the medical faculty, as well as the public in general, may receive benefit by it.'

["We sincerely wish good success to every pharmaceutical association devoting its energies to the welfare and progress of pharmacy, but we trust that our friends of Southern Illinois will well weigh the apparent necessities before they attempt to carry out their aim to establish a School of Pharmacy. Pharmaceutical education in the United States knows no geographical limits, and is not confined by narrow State boundaries; an indefinite multiplication of pharmaceutical schools could, in our opinion, be hardly otherwise than unfortunate in its results. Belleville, we believe, is distant but twelve or fifteen miles from St. Louis, where, for a number of years, a college of pharmacy has been struggling for a foothold, which it now seems to have gained, and will doubtless maintain if it receives a hearty support of all those pharmacists of St. Louis and vicinity who acknowledge the value of pharmaceutical education." *Editor of the Am. Journal of Pharmacy.*]

EDITORIAL.

With this issue we reproduce a table of reactions for alkaloids, published as a supplement to an original article, entitled "Contributions to Forensic Chemistry," by Henry Brunner, in Zurich, which appeared in the *Archiv der Pharmacie*, for April, 1873, in reference to which the author says: "I have prepared, for several years past, a table for the students in our analytical laboratory, according to Otto's "Determination of Poisons," which they use in making researches for any of the more known vegetable poisons. Though the table offers nothing new, aside from some reactions discovered of late, yet I hope that by its communication a practical aid is given to one or the other professional worker in forensic analysis. I have tried to arrange it so that a preceding reagent does not interfere with the one following." We hope that many of our readers may avail themselves of this excellently arranged table for the testing of the alkaloids, which we present as a supplement to the September number of our journal.

DR. BEVAN'S PREVENTIVE AND REMEDY FOR CHOLERA.

Our attention has been called to some inaccuracies which have occurred in compounding these combinations. They are being prescribed by some physicians of this city, and to prevent a repetition of the alleged errors, we herewith give the formulas.

THE PREVENTATIVE FOR CHOLERA.

Take of sulphite of magnesia, ʒ ij.
Sulphurous acid,
Water, of each f ℥ ij.
Tincture of capsicum, f ℥ ss.
Mix and make perfect solution.
Sig.: a teaspoonful night and morning.

THE REMEDY FOR CHOLERA.

Take of sulphite of magnesia, ʒ ij.
Sulphurous acid,
Water, of each f ℥ ij.
Tincture of capsicum, f ℥ ss.
Sulphate of morphia, gr. ij.
Mix and make perfect solution.
Sig.: a teaspoonful every half-hour or hour, until relieved.

The charge of error is, that the dispenser substituted *sulphate* of magnesia for *sulphite* of magnesia, and that either a dilute *sulphuric* acid, or a sulphurous acid which had undergone the change by oxidation into sulphuric acid, had been used instead of the *sulphurous* acid of the U.S. Pharmacopœia, and by this careless substitution had produced an effect not desired by the prescriber. Professor Bevan bases his mode of treatment on the theory that the nature of the malady is germinative or zymotic in character, and the principle of this prophylaxy and treatment is simply an extension of anti-zymosis to the organism itself. After a somewhat extended and careful observation of the action of anti-zymotic medicines he is satisfied that without detriment to the alimentary mucous membrane or the general organism, these remedies, according to the above given formulas, can be administered to the patient with the best of results, in larger doses than have heretofore been prescribed by medical practitioners.

Sulphurous acid can be prepared *fresh* by the dispensing pharmacist with but little difficulty, according to the process given in the U. S. Pharmacopœia. The same is also true of the sulphite of magnesia, which, if not in stock, can also be prepared by dissolving equal parts of sulphite of soda and sulphate of magnesia, each separately, in about 8 parts of water, and mix the two solutions; let stand to crystallize, or, by heating the mixture, the sulphite of magnesia, not being very soluble in water, is precipitated out of solution. It is then collected on filter, washed and dried. It was found that the excess in the atomic proportion of the sulphite of soda to the sulphate of magnesia gave a greater yield of the product.

BROMO-CHLORALUM.

In a communication to the editor, Mr. Tilden contradicts the statement contained in the August number of THE PHARMACIST in relation to bromo-chloralum being derived from bittern. In publishing the "story" referred to, we merely related what has been common report among persons who were supposed to know its origin, without in any way vouching for its accuracy. We are pleased to give place to the denial and to correct whatever erroneous impression it may have given rise to. The question of its origin does not in any way affect, so far as we know, the quality or usefulness of the article, as the so-called "bittern" does, without doubt, contain valuable properties for some purposes.

We take pleasure in announcing that the eminent chemist, Professor J. V. Z. Blaney, is about to open a school for practical laboratory instruction, assisted by his son and Prof. Brown, both of whom were formerly his assistants at Rush Medical College, in this city. We hope all pharmacal students who can will avail themselves of this opportunity to perfect their knowledge of laboratory manipulations, an essential feature in pharmacists' education.

The semi-annual meeting of the Chicago College of Pharmacy takes place Wednesday afternoon at 2½ o'clock, September 3d.

Reviews of Books, Donations and other items crowded out of this issue, will appear in our next.

THE PHARMACIST.

VOL. VI. CHICAGO, OCTOBER, 1873. NO. 10.

AMERICAN PHARMACEUTICAL ASSOCIATION.

TWENTY-FIRST ANNUAL MEETING.

FIRST DAY'S PROCEEDINGS.

The twenty-first annual session of the American Pharmaceutical Association commenced at the Virginia Opera House, in the city of Richmond, Va., at 3 o'clock Tuesday afternoon, September 16th. There were present about one hundred and fifty members, representing all of the large cities and many of the States of the North, South, East, and West.

The Association was called to order by the President, Albert E. Ebert, of Chicago, Ill., who referred to the happy coincidence that the tenth annual meeting of the British Pharmaceutical Conference at Bradford, England, and the twelfth annual meeting of the General Austrian Apothecaries' Association at Vienna, Austria, were in session at the same time. He then read the following telegram, and the answer, which he had taken the liberty to send in the name of the Association ;

BRADFORD, ENG., September 16, 1873.

To the President of the American Pharmaceutical Association, at Richmond, Va., United States of America :

Our members send hearty fraternal greetings to yours.

[Signed] The President of the British Pharmaceutical Association, at Bradford.

Answer :

RICHMOND, VA., September 16, 1873.

To the President of the British Pharmaceutical Conference at Bradford, England :

We return your hearty fraternal greetings.

[Signed] The President of the American Pharmaceutical Association.

The President then, by request of the local Committee of Arrangements, introduced Mayor Keiley, of Richmond, who extended to the Association, on behalf of the people of that city, a most cordial welcome. The Mayor spoke of the organization as one respectable in size and beneficent in its aims. The compliment in the choice of Richmond as their place of meeting was the greater because out of a membership of one thousand only three of the members—not as many as were necessary of the righteous ones to save Sodom—were from this city. He returned thanks to Professor Proctor, who had at the last session so zealously advocated the claims of Richmond, and also to Dr. Hickling, who had raised the historic cry of "On to Richmond!" and settled the question. He trusted that the advance, thus far, had been less costly and less fatal than a previous similar experiment; and also expressed the hope that this fraternal meeting of patrons of the healing art from different sections of the country, gathered at the capital of the late Confederacy, might have a tendency to heal those civil wounds so long kept open by the selfish greed of man, that he may reap the fruit of calamity and strife. It would be impertinent for him to speak as to details, but the general scope of the objects of this Association is of interest to all. If he understood that scope, the Association was designed not merely to compare experiments to raise the standard of scientific culture, but to discountenance those short cuts to wealth which disgrace all professions, and are exhibited in that great public vice of our country—unconscientiousness.

Mayor Keiley then briefly and eloquently referred to the field before the Association, after which he congratulated the organization upon the attainment of its majority in Richmond. He proposed that the members now be naturalized and remain evermore citizens of the Old Dominion. In conclusion he thanked the visitors for their good taste shown in bringing with them the fair representatives of their art. The ladies, he said, are never a drug in the market, and although old bachelors may consider them a dose, they must at least admit that they are *sugar-coated.* Some may call them precipitates, but every druggist knows the value of *precipitates;* certainly they are *elixirs;* and nobody will dare say they are *unofficial.* [Great applause.]

President Ebert responded to Mayor Keiley, and in behalf of the Association returned thanks for the hospitable reception with which they had been met.

The President appointed the following Committee on Credentials: Professor William Proctor, Philadelphia; George Leis, Kansas; Professor G. F. H. Markoe, Boston.

Mr. Paul Balluff, of New York, from the Committee on Business, reported a resolution inviting Professor Pratt, of Washington and Lee University, the Faculty of the Medical College of Virginia, and the medical profession generally, to privileged seats on the floor, and the public to the pharmaceutical exhibition on Wednesday evening, between the hours of 7½ and 9 o'clock. Adopted.

Dr. H. J. Menninger, of North Carolina, from the Executive Committee, reported the names of ninety-eight candidates for admission to membership. On motion of Mr. Bullock, of Philadelphia, the President was empowered to cast the vote of the Association in favor of the election of said candidates, which being done, they were declared duly elected.

The Secretary presented a communication from Leroy S. Edwards, Esq., President of the Young Men's Christian Association, inviting the members of this body to visit the rooms of that Association during their stay in the city. The invitation was accepted, with thanks.

The chairmen of the several standing committees announced that their reports were ready for the consideration of the Association.

The following colleges and associations were represented by delegates: Colleges of Philadelphia, New York City, Massachusetts, Maryland, Chicago, Cincinnati, Louisville, Tennessee, Kansas, Mississippi, Ontario, and National of Washington, D.C.; Associations of Alleghany County, Saginaw Valley, Newark and New Jersey, and the Alumni of the Colleges of Philadelphia, New York City, Maryland and Massachusetts.

The St. Louis and California Colleges of Pharmacy were not represented by delegates at this meeting. The roll was now called and the following members answered to their names:

J. M. Maisch, Philadelphia, Pa.; Albert E. Ebert, Chicago, Ill.; H. J. Menninger, Raleigh, N. C.; Geo. Leis, Lawrence, Ka.; Paul Balluff, New York City; Jn. T. Buck, Jackson, Miss.; William Proctor, Philadelphia, Pa.; E. P. Nicholds, Newark, N. J.; B. O. Wilson, Boston, Mass.; M. L. Peixotto, New York City; Jos. L. Lemberger, Lebanon, Pa.; Fred. Hoffmann, Ph. D., New York City; Benj. Lillard, Nashville, Tenn.; D. H. Rogers, Middletown, N. J.; M. C. Hall, Fredericksburg. Va.; P. W. Bedford, New York City; H. N. Rittenhouse, Philadelphia, Pa.; Isaac H. Kay, Philadelphia, Pa.; C. W. Hancock, Philadelphia, Pa.; Wm. Neergard, New York City; Ed. L. Boggs, Charleston, W. Va.; A. Boyd, Utica, Ohio; J. J. Estes, East Abington, Mass.; Chas. A. Heinitsh, Lancaster, Pa.; Louis Dohme, Baltimore, Md.; J. F. Hancock, Baltimore, Md.; B. F. Stacey, Charlestown, Mass.; William Vincent, Williamsburg, N. Y.; N. Hyson Jennings, Baltimore, Md.; J. A. Meyer, Columbia, Pa.; W. F. Horton, Boston, Mass.; Alf. N. Marion, Baltimore, Md.; E. R, Squibb, Brooklyn, N. Y.; O. Neustadt, New York City; W. H. Brill, Alleghany, Pa.; G. J. Luhn, Charleston, S. C.; Harrison S. Lutz, Alleghany, Pa.; J. R. Jones, Danville, Va.; Alonzo Robbins, F. A. Vogelbach, H. Edw. Wendel, Philadelphia, Pa.; Edw. A. Cornell, Williamsport, Pa.; S. Mason McCollin, R. V. Mattison, Philadelphia, Pa.; G. S. Lee, Raleigh, Va.; A. S. White, Mt. Holly, N. J.; Geo. F. H. Markoe. Boston, Mass.; R. W. Vanderwort, Newark, N. J.; Robt. W. Gardner, Jersey City, N. J.; F. V. Heydenreich, E. Heydenrich, Brooklyn, N.Y.; Geo. A. M. Wilburn, Jno. R. Major, W. S. Thompson, Oscar Oldberg, Washington, D. C.; J. Creuse, Brooklyn, N. Y.; Joel S. Orne, A. R. Bayley, Cambridge, Mass.; Wm. Saunders, London, Ont.; T. Roberts Baker, Wm. H. Scott, Richmond, Va.; Clay W. Holmes, Wilkesbarre, Pa.; Robt. B. Wood, H. Emil Fisher, Richmond, Va.; Fred. H. Masi, Norfolk, Va.; J. D. Wells, Chas. M. Helman, Cincinnati, Ohio; Wm. Simpson, Raleigh, N. C.; Adolph W. Miller, Philadelphia, Pa.; James Wears. New York City; J. H. Stein, Reading, Pa.; J. C. P. Fulton, Brooklyn, N. Y.; W. H. Pile, M.D., Philadelphia, Pa.; J. A. Miller, Harrisburg. Pa.; Geo. E. Cook, Port Jervis, N. Y., Chas. Bullock, Henry K. Bowman, Edw. C. Jones, Philadelphia, Pa.; W. R. Fenner, Rome, Ga.; W. A. Patton, Catlettsburg, Ky.; Chas. H. Crepler, William Heyser, Chambersburg, Pa.; Geo. W. Kennedy, Pottsville, Pa.; Chas. W. Badger, Newark, N. J.; Randal Richey, Trenton, N. J.; Ferd. Hassencamp, Baltimore, Md.; Jos. P. Remington, Philadelphia, Pa.; C. Lewis Diehl, Louisville, Ky.; Chas. A. Tufts, Dover, N. H.; A. A. Kleinschmidt, Baltimore. Md.; S. S, Garrigues, E. Saginaw, Mich.- B. H. Reinold, G. Pfingsten, New York City; Jos. Anthony, Richmond, Va.; Jos. H. Feemster, Cincinnati, Ohio; J. W. Worthington, Morristown, N. J.; Ira W. Blunt, Lewis Wagner, John E. Dove, Richmond, Va.; Charles Eimer, New York City.

The Committee on Business called up the amendments to the constitution proposed at the last session of the Association, held at Cleveland, Ohio. Alter some discussion Article VI. Chapter VI. of the constitution was amended to make it read: "All local organizations of pharmacists shall be entitled," &c.

In order to have the Committee on Specimens appointed at the first meeting, the following change in the by-laws was adopted:

Remove Section 8 of Article III., Chapter VII., so as follow Section 8 in II. of same chapter.

On motion the consideration of the amendment proposed to Article V. in relation to sinking fund was deferred until the reading of the Treasurer's report.

Professor Proctor, from the Committee on Editorship of the Report on the Progress of Pharmacy, presented a report recommending that an officer be hereafter appointed with the title of Reporter on the Progress of Pharmacy, and that the Reporter be paid an annual salary of $250. The committee nominated for the new office Professor C. Lewis Diehl, of Louisville, Ky.

The report was adopted.

Prof. Maisch presented the report of the Executive Committee, giving an account of the business of the Association during the year, and announcing the death of the following members since the last meeting:

Elias Durand, Edward Parrish, of Philadelphia; Kline C. Lineaweaver, of Washington, D.C.; T. W. Metcalf, W. E. P. Bayliss, W. J. Watson, of Brooklyn, N.Y.; E. W. Sackrider, of Cleveland; Dr. Hermann Ludwig, Jena, Germany; and Dr. Arthur Casselmann, St. Petersburg, Russia.

The Committee on Nominations of Officers for ensuing year was then appointed, also a committee of five on specimens.

On motion of Mr. John F. Hancock, of Baltimore, Mr. James R. Mercein, of Brooklyn, was requested to furnish to the reporter of the Association his report on the Progress of Pharmacy.

The President, Mr. Ebert, then read his annual address, reviewing the operations of the Association during the past year, and making suggestions as to the best means of promoting the objects of the Association. The hospitality of the citizens of Richmond was appropriately acknowledged and the belief expressed that this will be one af the most important meetings ever held. The report was appropriately referred to a committee.

The Secretary reported several donations of books, including a copy of the Medical History of the Rebellion.

The Association then adjourned until 9 o'clock Wednesday morning.

SECOND DAY'S PROCEEDINGS.

The Association re-assembled at 9.30 Wednesday morning, President Albert E. Ebert presiding.

The report of the Nominating Committee was read by Professor Geo. F. H. Markoe, and adopted. The officers of the Association elected for 1873–74 are as follows:

President.—John F. Hancock, Baltimore, Maryland.

Vice-Presidents.—William Saunders, London, Ontario; John T. Buck, Jackson, Mississippi; Paul Baluff, New York City.

Treasurer.—Charles A. Tufts, Dover, New Hampshire.

Permanent Secretary.—John M. Maisch, Philadelphia, Pennsylvania.

Executive Committee.—Thomas S. Wiegand, Philadelphia, Penn.; George Lies, Lawrence, Kan.; Charles L. Eberle, Philadelphia; Henry J. Menninger, Raleigh, N. C.; and John M. Maisch, *ex-officio*, Philadelphia.

Reporter on the Progress of Pharmacy—C. Lewis Diehl, Louisville, Ky.

Committee on Papers and Queries.—James P. Remington, Philadelphia; Louis Dohme, Baltimore: and Benjamin Lillard, Nashville.

Business Committee.—E. P. Nichols, Newark, N. J.; Joel S. Orne, Cambridgeport; Mass.; and J. F. Judge, Cincinnati, Ohio.

Mr. Peixotto, of New York, was excused from serving on the Committee on Specimens, and W. H. Scott, of Richmond, was appointed in his stead.

Mr. Hancock, the President elect, not being present, Mr. William Saunders, of Canada, the First Vice President, was conducted to the chair, and in assuming it thanked the Association for the honor done him.

Charles A. Tufts, of New Hampshire, the Treasurer, submitted his annual report, showing that all the debts of the Association, as far as known by him, had been paid, and there is $982.77 on hand. Referred to an auditing committee, consisting of Messrs. Jennings, of Baltimore; Stacy, of Charlestown, Mass., and Baker, of Richmond.

The Secretary read a note from Mr. Albert E. Ebert, of Chicago, the retiring President, as follows:

SEPTEMBER, 1873.

To the American Pharmaceutical Association:

GENTLEMEN,—To further original investigations and to inaugurate a system of prizes by this Association to those who by study and application shall add to our knowledge of medicinal substances, I have the pleasure to present to this Association the enclosed sum [five hundred dollars] to be used in the following manner: The money to be invested by the Executive Crmmittee, and the annual interest derived therefrom to be appropriated for conferring a suitable prize for the best essay or written contribution, containing an original investigation of a medicinal substance, determining new properties or containing other meritorious contributions to knowledge, or for improved methods of determined merit for the preparation of chemical or pharmacal products. The prize to be awarded by a suitable committee within six months after the annual meeting at which the essays are presented for competition, provided that in case no one of the essays offered is of sufficient merit to justify the award in the judgment of the committee, all may be rejected and the sum added to that of the fund.

Respectfully,

ALBERT E. EBERT.

Mr. George Leis, of Kasas, offered a resolution thanking the retiring President for his liberal donation, and providing that it shall be called the "Ebert Fund," and the prize distributed under it be called the "Ebert Prize." Adopted.

At this point Past Presidents R. H. Stabler of Alexandria, and Wm. Proctor of Philadelphia, conducted the newly elected President to the chair, and he was introduced to the Association by Vice President Saunders.

Mr. Hancock, in the course of his remarks, made upon assuming the position of presiding officer, said:

I, in the name of the Association, extend our hearty thanks to the members of our profession in the beautiful City of the Seven Hills, and to the Mayor of the city, who so pleasantly and appropriately extended the hospitality of the city to ourselves and those sojourning with us, in which he included our "sugar-coated pills," "elixirs," and "precipitates"—all "officinal."

I have had the pleasure of attending many meetings of the Association, but never have I witnessed such cordial reception as has been extended to us in this city, and when we take up our line of march from this place, I am sure it will be with many regrets mingled with many pleasant remembrances of our friends in the sunny South,

with whom it has been our good fortune to associate in these few hours of our presence here, and it is our most earnest wish, brother pharmacists of Richmond, that we shall soon receive the good tidings of the organization of a Pharmaceutical Society or College of Pharmacy in this city of the Old Dominion.

The report of the Committee on Adulteration and Sophistication, prepared by Charles Rice, of New York, who was not in attendance by reason of other engagements, was read by M. L. Peixotto. Adopted.

Prof. C. Lewis Diehl, ot Louisville, Ky., presented the report of the Committee on the Progress of Pharmacy. On motion of Dr. Squibb, it was ordered that he be paid $250 out of the treasury for the same. He also moved that the salary of the reporter on Progress of Pharmacy, heretofore fixed at $250 per annum, be left open to be filled at the next meeting.

The report of the Committee on Unofficinal Formulas being called for, Mr. Ebert stated that he was authorized by the chairman of that committee (Edward L Milhau, of New York,) to say that sickness and other engagements had prevented him from preparing a report.

Mr. S. M. Colcord, of Boston, in behalf of the Committee on the Centennial Celebration, presented a report detailing a full plan for a congress of pharmacists of all nations at Philadelphia during the centennial celebration, and recommending that the meeting of this Association in 1875 be held in Boston, in order to have a large attendance of members and to better prepare for the centennial. Received and referred.

A letter from Mr. C. W. Grassly was read, alleging that he had been badly treated by the Association, and tendering his resignation as a member. The Association, on motion, ordered that the letter be placed on file, and that Mr. Grassly be expelled for indecorous treatment of the Association and its officers.

Dr. E. R. Squibb, of Brooklyn, N. Y., read a volunteer paper "On Buying Alcohol and Distilled Spirits, with a Table and Wood-cut Illustration." On motion, it was referred for publication, and thanks of the Association returned.

At about 12.30 o'clock the Association took a recess until 3 o'clock, in order to allow members to visit the exhibition room.

AFTERNOON SESSION.

The Association reassembled according to adjournment, President Hancock in the chair.

The President announced the following committee on time and place of next annual meeting: Messrs. Joel Orne, of Mass.; Robert W. Gardner, of New Jersey; and Lewis Dohme, of Maryland.

The auditing committee reported the treasurer's account correct in every particular. Adopted.

The credentials of the delegates from the Cincinnati College of Pharmacy were presented and approved.

The by-laws were amended in relation to the salary of the reporter on the progress of pharmacy, so as to read, that he shall be elected annually, and receive "such sum as may be determined upon each year."

Dr. Squibb read a paper on "rhubarb" in relation to its commercial value, and comparing the qualities of the different varieties. Dr. Squibb also read a paper on "physicians' pocket cases," and showed samples of some made after his own design. Both papers accepted and referred for publication.

Prof. G. F. H. Markoe, of Boston, read a paper on the United States Pharmacopæia. Accepted, referred.

P. W. Bedford, in reply to the query assigned to him, said that "balsam of tolu could *not* be rendered emulsionizable like copaiba."

Mr. George W. Kennedy, of Pottsville, Pa., read a volunteer paper discussing the question, "Does the root of Frazera Walteri contain Berberina?" Accepted, referred.

The secretary read an invitation from Mr. Wm. H. Scott, of the local committee of arrangements, inviting the members of the Association to join in an excursion down James River as far as Dutch Gap, leaving the city on the steam barge Greenbush this (Thursday) afternoon at 3 o'clock. The invitation was accepted with thanks.

Responses were read to

Query 1. Can a permanently flexible gelatine plaster be prepared by some addition to the isinglass used which will prevent the tendency of the plaster to curl and irritate the skin mechanically? By Henry N. Rittenhouse, of Philadelphia.

Query 7. "Sapo Viridis" vel "Sapo Mollis" is sometimes prescribed. What is the easiest plan of making it from olive oil and liq. potassæ? By Paul Fred. Lehlbach, of New York.

Query 12. What merit has petroleum benzine as a solvent for the extraction of oleo-resinous drugs like buchu, chenopodium, etc.? Answered by Joseph P. Remington, of Philadelphia.

Query 15. Can the proportion of sugar and honey be improved in the officinal process for pil. ferri carbonatis? Answered by Edward D. Chapman, of Philadelphia.

Query 18. What is the actual value of orange-colored window glass as a means of preventing the chemical action of light on volatile oils? Answered by Prof. William Proctor, Jr., of Philadelphia.

Query 20. Cannot an improvement be effected in the material and workmanship of cheap ointment boxes? Responded to by Mr. J. P. Remington.

Query 21. What is the correct time to collect the leaves of biennial plants like lobelia, hyoscyamus, and digitalis? Answered by Professor J. M. Maisch, of Philadelphia.

Query 24. Is there no better method of preparing cucumber ointment than that now in use by heating the juice with fats? Answered by Prof. William Proctor, Jr., of Philadelphia.

Query 26. Can any improvement be suggested in graduated measures by which greater uniformity can be attained? Answered by Dr. W. H. Pile, of Philadelphia.

Query 28. An essay, suggestive and critical, on labeling shop furniture, stock bottles and vials, in view of permanence, regularity, and safety; also, a label case to facilitate the finding of the same. Answer by George H. Schafer, Fort Madison, Iowa.

The following letter was read, and the secretary was directed to acknowledge and accept with thanks the proposition made in it:

"RICHMOND, September 16, 1873.

"*Mr. John M. Maisch, Secretary:*

"DEAR SIR—It affords me pleasure to be in position to offer an exchange of our Society's publications as a partial expression of our high appreciation of the laudable objects for which your Association is organized. You may feel assured that whatever you may do to elevate the standard of your profession, and thereby discountenance quackery and dishonest imposition, will meet with the hearty favor and cordial support of the community in which you are assembled, and especially of the Medical Society of Virginia. Very respectfully yours,

"LANDON B. EDWARDS,
"*Secretary Medical Society of Virginia.*"

At 7 P. M. the Association adjourned until 9 o'clock Thursday morning.

THIRD DAY'S PROCEEDINGS.

At 9.35 Thursday morning, the Association was called to order by the President.

Dr. Nichols, on behalf of the business committee, made a report on the President's address, which was adopted, after striking out a proposition to authorize the executive committee to publish in scientific journals papers laid before the Association before they have been published in the proceedings of that body.

An amendment to the Constitution, proposing to create a sinking fund, was rejected.

Dr. Squibb stated that the time of the Association was usually greatly encroached upon by propositions on behalf of their hosts to participate in excursions, feasts, and other entertainments of the whole body. He thought that a resolution should be passed declining all such for future meetings.

Professor Markoe thought that all discussion of this subject was time lost; that the majority of the Association always had been and always would be in favor of accepting whatever hospitalities might be offered. He would suggest that the subject be dropped. His suggestion was concurred in.

Dr. Nichols, from the committee on the time and place of the next meeting, reported, suggesting that it be held at Louisville, Ky., on the third day of September, 1874. The report was adopted.

On motion, Mr. Emil Scheffer, of Louisville, Ky., was elected local secretary.

Professor Maisch, chairman of the committee on legislation, reported the laws recently passed by different states regulating the practice of pharmacy.

The committee was discharged, and, on motion of Professor Maisch, the President was requested to appoint another.

The committee on photographic album reported that they have received very few photographs of members during the past year, and urge the desirability of the collection of such mementoes. They state that one of the members of the committee has secured about 125 cards of the officers and permanent members of the Association, and having placed them in a suitable album, has forwarded them in the name of the Association to the British Pharmaceutical Conference.

The President announced the appointment of the following committee on photographic album: P. W. Bedford, of New York; C. A. Tufts, of Dover, N. H.; J. P. Remington, of Philadelphia; R. J. Brown, of Leavenworth, Kansas; E. H. Sargent, of Chicago.

Professor Benjamin Lillard, of Nashville, read a volunteer paper on homœopathic pharmacy; which was referred to the executive committee.

The President announced the appointment of the following committee on the "Ebert" prize: Charles Bullock, William H. Pile, and John M. Maisch, of Philadelphia.

The committee on the drug market reported through Mr. P. W. Bedford, its chairman.

The queries were now taken up and replies read.

Query 30. What shall I read, and where shall I begin? An essay in reply to this constantly-recurring query of beginners, who are confused by the mass of books presented to them as the source of knowledge they need, was read by Professor William Proctor, Jr., of Philadelphia.

Query 11. The statistics of the American bromine production was read by Dr. S. S. Garrigues, of East Saginaw, Mich.

He also exhibited specimens of oak nutgalls collected near Huntington.

Query 31. An essay on what are poisons in pharmacy, and what plan is most efficient in guarding them from improper use in the shop, was presented by Professor Charles L. Eberle, of Philadelphia.

Query 32. An essay on the insect enemies of drugs, on the best means of protecting sound drugs from their ravages, and on the means of destroying them when already in drugs, was presented by William Saunders, of London, Ontario.

He also read a volunteer paper on that interesting and curious insect, the honey ant. It is found in the neighborhood of Santa Fe, New Mexico. The honey, which is carried by the ant in its abdomen, is used by the natives as food and for medicinal purposes. The paper was accepted and referred to the executive committee.

Dr. E. R. Squibb read a volunteer paper on "Ergot and its preparations;" also, one on "A general apparatus stand, upright condenser, pinch cock, and burette stand." Both were accepted with thanks and referred to the executive committee.

Query 35. What is the best strength of alcohol to exhaust columbo for tincture and fluid extracts? Answered by Charles L. Eberle.

Query 37. Should not aromatic powder (U. S. P.) be made by powdering the crude ingredients all together to facilitate pulverization? Replied to affirmatively by Joseph L. Lemberger, of Lebanon, Pa.; and referred for publication.

On motion, it was resolved that all queries not answered should be dropped when there was no request for continuance.

Query 42. What is the purity of commercial tartaric acid, and what is the normal percentage of moisture? Responded to by Henry J. Rose, of Toronto, Canada; and referred.

The report of the Committee on Formulas for Elixirs being called for, Dr. E. P. Nichols took the chair, and John F. Hancock read the report.

On motion, J. F. Hancock was appointed Reporter on Unofficinal Formulas.

On motion of Professor Maisch, it was resolved that the report of the Committee on Formulas for Elixirs be adopted, with the recommendation that the formulas they suggest be used by the members of the Association, and that the secretary be instructed to send a printed copy of the report to the medical societies of the country, with the suggestion that physicians, if prescribing elixirs at all, prescribe only such as have been adopted by this Association.

On motion, it was resolved that all incorporated pharmaceutical colleges, that have not done so, be requested to nominate members to be added to the Committee on Pharmacopœia.

After the appointment of the following standing committees, the Association adjourned at 2. 30 P. M., until Friday morning at 9 o'clock.

Committee on Adulteration and Sophistication.—Charles Rice, Chairman, New York, N. Y.; Thomas N. Jamieson, Chicago, Ill.; Emil Scheffer, Louisville, Ky.

Committee on Legislation.—John M. Maisch, Chairman, Philadelphia, Pa.; E. H. Sargent, Chicago, Ill.; Robert S. McMurdy, Albany, N. Y.; Henry J. Meninger, Raleigh, N. C.; Matthew F. Ash, Jackson, Miss.; Hubert Primm, St. Louis, Mo.

Committee on Liquor Dealers' License of Apothecaries.—J. Faris Moore, Chairman, Baltimore, Md.; R. W. Gardner, Jersey City; Robert J. Brown, Leavenworth, Kansas; Charles H. Dalrymple, Morristown, N. J.; Matthew F. Ash, Jackson, Miss.

Committee on Infringement of Stamp Tax.—Charles H. Dalrymple, Chairman, Morristown, N. J.; J. Faris Moore, Baltimore, Md.; William Hegeman, New York, N. Y.

FOURTH DAY'S PROCEEDINGS.

At 9.30 Friday morning, the President called the Association to order. The minutes of the previous meeting were read and approved.

On motion, it was resolved that the President in his annual address may discuss such scientific subjects as he may deem best, instead of making a report of the operations of the Association during the year, as provided by the constitution.

The report of the Committee on Exhibition, made through Dr. A. W. Miller, of Philadelphia, was accepted and referred.

Dr. Squibb gave notice that as an acknowledgement of the increased labor upon the permanent secretary and treasurer, he would move an amendment to the by-laws increasing their pay by the sum of $100 each. This will come up at the meeting next year.

He also moved that the reporter on the Progress of Pharmacy be paid $400 for his services this year, instead of $250, as already fixed. The motion was unanimously adopted.

Query 33. Is sarsaparilla altered in its sensible properties and injured in its medicinal qualities by the heat of a water or steam bath? Answered in the negative by J. F. Judge of Cincinnati, Ohio.

Query 45. Solutions of salts of atropia, strychnia, and other alkaloids for medicinal use are liable to be spoiled by the growth of microscopic organisms. This is prevented by the addition of solution of carbolic acid. How small a proportion of carbolic acid will protect such solutions from change? Answered by E. H. Squibb: When the solution is properly made, one-seventh of one per cent is the smallest proportion of carbolic acid that will protect them from change; but one-sixth of one per cent is practically better and safer in ordinary practice, and the latter proportion is unobjectionable in all known respects. Accepted and referred.

A volunteer paper on gelseminia and gelseminic acid, presented by Charles C. Fredigke, of Chicago, was read and referred.

Query 46. When a strip of paper moistened with water of ammonia is held near the mouth of a bottle of chloral, white fumes are generally noticeable, particularly in warm weather, on close observation. Often the fumes are so white as to be easily seen, and sometimes on a very damp and hot day, they are visible without the use of ammonia. Is this an evidence of the decomposition of chloral, varying only in amount or degree from that decomposition which is evident when the fumes are very copious and attended with the smell of chlorous and hypochlorous acids, and what are the common accidents which determine the decomposition of chloral? Answered by Professor Maisch, who also read a paper on the Best Method of Assaying Cantharides and their Preparations for Cantharidin. Both were referred to the Executive Committee.

B. F. Stacy, of Charlestown, Mass., presented a volunteer paper on Indian Medicinal Remedies.

The list of queries was completed; and a volunteer paper on Physicians and Apothecaries, by A. T. Moith, of Fishkill, N. Y., was read and referred.

Professor Maisch stated that his attention had been called to the fraudulent substitution of muriate of cinchonia for sulphate of quinia. The fraud is principally practiced upon the southern interior towns. The former is worth about fifty cents an ounce, and the latter about $2.50.

Professor Markoe exhibited specimens of deposits of diatomaceous earth found in Richmond. He stated that immense deposits of this earth are found in this vicinity, the city being in part built upon it. This formation, which accumulated during centuries, consists of the skeletons of microscopic plants in a fossil state. They are favorite subjects of microscopic study among scientific men, some of the finer forms being used as delicate tests of the strength and reliability of lenses.

Professor Diehl reported the queries presented and accepted for next year.

On motion it was unanimously

Resolved, That the thanks of the Association be presented to the press of Richmond for their attention and their efforts to place before the public a report of our proceedings.

Dr. Squibb remarked that the reports made by the press of this city had been very faithful, and attended with far fewer mistakes than ever before. To report correctly the proceedings of the Association is a very difficult task, and all the more credit attaches to its successful accomplishment.

The following resolution, offered by the Business Committee, was unanimously adopted:

> "The American Pharmaceutical Association is now about to close its twenty-first annual session in the capital of the Old Dominion. Some hesitation was felt at the last meeting in deciding on this place, but the success of our experiment at Cleveland induced to repeat it. The kind courtesy and generosity of our reception, the unbounded Old Virginia hospitality of the pharmacists and citizens of Richmond, and the beautifully-appropriate welcome of his Honor the Mayor of this city, has dispelled every doubt of the propriety of our selection. Nothing has been left undone that could add to our comfort and pleasure; and when we leave this place to return to our homes we chall carry with us pleasant recollections of this visit which will not soon be effaced from our memory. As a faint expression of our warm appreciation of the kindness shown us, be it
>
> "*Resolved*, That the hearty thanks of this Association be and are hereby tendered to the pharmacists and citizens of Richmond for the cordiality of our reception at this our first visit to the 'Sunny South.'"

A motion to adjourn was then made, but before the motion was put to vote, the President made a few remarks, which he stated were addressed to the pharmacists of Richmond. After briefly reviewing the objects of the Association, which he stated was not that of a migrating excursion party for pleasure, but that it met each year in different places in order to further the usefulness of the Association. He stated that the late war, by its unhappy results, had severed from membership the members of the South, and it was feared that because of an idea that the pharmacists of other sections of the country still indulged hard feelings toward them they had not renewed their connection with the Association. In order that this erroneous impression might be done away with, it was decided by this Association, at its meeting last year, to meet this year in this city of the South, so that an opportunity might offer to extend the hand of fraternal greeting and invite them to join us in unselfish devotion to pharmaceutical progress. He stated that before the hand of fraternal greeting had been so extended, a cordial welcome had been offered by the Reception Committee; and afterward, the hearty welcome of his Honor the Mayor. In this last hour of meeting, he desired to remind the pharmacists of this city that this is the most opportune time that will ever be offered them to formally organize a Pharmaceutical Society, and reminded them, in the language of the late Professor Edward Parrish, to strike while the iron is hot, and not let the fire of their pharmaceutical fever cool. He expressed the hope that a Richmond Pharmaceutical Association will be immediately organized, looking to the establishment of a permanent organization, and that at the next annual meeting of this Association, it may be their extreme pleasure to meet a delegation from the Richmond Pharmaceutical Association or College.

At 12.30 P. M. the Association adjourned to meet at Louisville, Kentucky, on the second Tuesday in September, 1874.

FLUID EXTRACT OF CINCHONA.

BY R. ROTHER.

Fluid extract of cinchona is an impressive and self-asserting title, which spreads itself imposingly across the page of the Pharmacopœia. It sounds pleasantly in the medical ear, and conveys happy reminiscences of the expanding grandeur of medical *science* and art through the therapeutist's mind.

The physician is gratified, the patient is satisfied, and the pharmacist is—still in a dilemma. The important question to him revolves, not about the point relative to its activity or general usefulness, because activity in some degree cannot be denied even to the average product as we find it in the shops, however doubtful its general utility may seem. The perplexing query which now agitates the pharmacal mind and demands a solution sooner or later, the sooner the better, is how to bring the object into unison with its name, from which, according to its definiition, it must be inferred that the fluid extract of cinchona embodies the total activity of the drug in a liquid form. The formerly officinal fluid extract, although but half as much active material was consumed in its prepartion as for a similar volume of the new officinal one, did evidently not supply the exact desideratum. From the method now in use we must likewise apprehend that the product stands not in officinal harmony with its appellation. By an inspection of the active component parts of cinchona bark, and their relative proportion in the normal state, it is easily comprehended that the alkaloids existing in the bark are totally combined as salts. It is supposed that kinovic acid is present in an uncombined condition, and it is also highly presumable that the cincho-tannic acid, at least in greater part, is free. Sulphuric acid is usually present mostly united with calcium, but occasionally in combination with the alkaloids. Kinic acid is infallibly combined, partly with the alkaloids, but more profusely with calcium.

It is, however, probable that although the cincho-tannic acid is preponderatingly abundant, it may yet exist in the bark in an occluded position, which does not admit of direct contact with the bases until the various constituents of the bark are brought into immediate contact through the intervention of a common solvent, which brings the substances aggregated within the distinct cortical layers together, or even mingles those which, while found in the same layer of bark, were held asunder in the native form by the organic structure and natural distribution of the various ingredients.

When the bark is treated with water alone, a very imperfect extraction of the activity is effected. The aqueous infusion will naturally contain very little, if any, of the cincho-tannic acid, because its combinations with the alkaloids are very sparingly soluble in water. The solution will, therefore, contain the alkaloidal salts as sulphates or kinates, or a mixture of both.

In the production of the ridiculous preparation known as "extractum chinæ frigide paratum," which, though not prepared by exactly the same process, is officinal in most of the European pharmacopœias, the action of cold water in very large proportion is resorted to as a solvent in most cases. For this purpose the inferior barks designated as "fuscum" (pale bark, U. S.), are directed. The preparation is chiefly valued for its astringent properties, as it is mainly a concentrated syrupy solution of cincho-tannic acid containing coloring extractive, gum, calcium kinate, perhaps calcium kinovate, and a small proportion kinate of cinchonia. The preparation is moderately bitter, owing to the presence of a little cinchonia kinate, but the bitterness may also be due to kinovic acid which, being insoluble in water in an isolated condition, is yet exceedingly soluble when associated with calcium or some other particular base. Kinovic acid is a glucoside which, under the action of powerful acids, is decomposed into another acid and a peculiar sugar. It has no febrifuge virtues whatever, but is found to be an excellent tonic. Uncombined kinovic acid is, however, very soluble in alcoholic liquids; hence, alcoholic preparations of the bark will contain also the free kinovic acid, which an aqueous liquid would fail to extract. An aqueous infusion of the bark is at best only a weak solution of but a part of the active principles. During a moderate maceration, kinates of the alkaloids will first dissolve, but eventually the cincho-tannic acid, together with coloring extractive, etc., will enter the solution.

If tannin, likewise cincho-tannic acid, is mixed with soluble salts of the alkaloids, insoluble tannates will precipitate when the solution is simply aqueous, but in an alcoholic liquid the tannates of quinia and cinchonia are soluble in a high degree. When an alcoholic solution of the tannates is diluted with water, the salts are almost completely precipitated. This makes it apparent that if a portion of the alkaloids in the barks pre-exist as cincho-tannates, water alone will not wholly extract them. Furthermore, if the aqueous macerate which is first obtained be united with the subsequent extractions, precipitation will result in separation of insoluble cincho-tannates of the alkaloids, even if the liquid be very dilute. After filtration and evaporation to dryness or a syrupy consistence, the dense solution will usually be free from sediment, but if this apparently perfect solution be moderately diluted with water, a fresh and rather abundant precipitate will again occur. If the filtrate be again evaporated and once more diluted, more insoluble matter is deposited. After several repetitions of this treatment, it hardly admits of doubt but that the last alkaloidal traces will be removed. It is, however, probable that the precipitation is partly caused by the conversion of the cincho-tannic acid into insoluble cinchonic red. The explanation of the fact that the dense liquid is a perfect solution, is found in the important observation which was only recently made on the peculiar action of various alkaloids and other organic principles which, in a concentrated liquid form, mutually assist in retaining their perfect solubility, which in an isolated condition some of them do not possess.

Sugar approaches this peculiar effect in many particulars, and hence it was long employed for this purpose before even the other fact was known or recognized. The concentrated syrup which holds certain organic matters in perfect and permanent solution, however, loses this property much more rapidly than the rate of dilution increases. A moderate amount of water will often perfectly precipitate the matters which were held in perfect solution by the syrup. Probably the presence of extractive soluble in water, or even glucosides, act analogous to sugar in such instances. It was, however, found that sugar did not behave desirably in connection with cinchona; but it was discovered that glycerin presented greatly superior advantages. Glycerin is a most excellent solvent for nearly all the tannates, but particularly those of organic bases. It dissolves semi-resinous bodies, peculiar coloring matters, and various other extractive-like material with avidity, and so thoroughly that dilution with water often causes no separation. Recently, however, since glycerin has been so largely thrown into contact with all imaginable substances, it has been ascertained that this extreme solvent power is chimerical in a great measure, and that the beloved hobby of a terribly progressive portion of our *pharmacal* savans is beginning to show unmistakable signs of demoralization.

Several years ago the writer witnessed how fluid extract of senna, among others, yielded large sediments in the presence of glycerin, an occurrence which moderately dilute alcohol did not permit, at least not by any means to an equal extent. The writer also found that in a fluid extract of cinchona, prepared with a menstrum containing glycerin, a copious deposit was formed. Furthermore, although fluid extract of cinchona is apparently one among only a few preparations which could justly tolerate the presence of glycerin, and that with decided partiality in opposition to all other menstrua, still it is doubtful whether it represented the crude material more faithfully, or even approximatively, to an acidulated alcoholic menstruum.

The writer several years since suggested a menstruum composed of chlorhydric acid, alcohol and water, which he has since found to be superior in point of elegance, permanence and general quality of the result to any other one that has been proposed. The chlorhydric acid was added in obviously large proportion, but in view of the tolerably great amount of bases to be saturated, there was scarcely any in excess; hence, no fear could be entertained that the free chlorhydric would determine undesirable changes, as, for instance, the destruction of the kinovic acid. It was assumed that the finished preparation would contain *all* the alkaloids as hydrochlorides, all the calcium except that which existed as sulphate, as chloride, and all the kinic and kinovic acid, as well as *all* the cincho-tannic acid free. The advantages will be seen from a comparison. In the new officinal fluid extract, it is questionable whether the native calcium kinate is present, owing to the fact that calcium kinate is insoluble in alcohol. Probably, for a like reason, we can surmise the absence of calcium kinovate. It is also highly presumable that the cincho-tannic acid is not fully represented, because an acidulated alcoholic liquid is a far greater solvent for this than alcohol alone, or mixed with glycerin. The officinal fluid extract will, therefore, contain not only kinates of the alkaloids, but also cincho-tannates of these bases, together with some cincho-tannic acid in excess. Hence, on dilution with water, the abundant precipitate indicates not only the dissolved cinchonic red, but all the alkaloids combined as cincho-tannates, and possibly, also, much of those combined previously with kinic acid, but which the cincho-tannic acid has now appropriated by aid of aqueous dilution.

The fluid extract prepared with chlorhydric acid, and containing still more cincho-tannic acid than the preceding, would ordinarily indicate that dilution with water will separate from it even more alkaloids than from the former. This is a plausible view, but it is in actual opposition to facts. When the acidulated fluid extract is diluted with water, a copious precipitate falls out, the turbid mixture filters with great rapidity, and perfectly clear. The filtrate has a faint yellowish tinge, a very decided bitter, slightly acidulous taste, and remains permanently clear. Treated with alkalis, abundant precipitates are produced, and when poured into a tannin solution, a precipitate is immediately thrown down; but if the filtrate is added in excess, the precipitate is mostly re-dissolved, and an opalescent mixture results, which gradually deposits a sediment. When the acidulous filtrate is treated with ferric chloride or citrate, the color immaterially deepens, and when the solution containing ferric citrate is set aside a short time, an abundant greenish brown flocculent precipitate descends. If, however, tannin be added to the mixture with the iron, a greenish black precipitate is largely produced.

These results show that the free acid (kinic acid) in the filtrate, prevents the cincho-tannic acid from precipitating any more than a minimum of the alkaloids, and also that a very appreciable amount of cincho-tannic acid yet exists in the acidulous liquid. From this it becomes evident that cincho-tannic acid forms salts with the alkaloids in various proportions, according to the amount of alkaloid or acid present, and the state of the solution in regard to acidity derived from the presence of a stronger acid. That is, in a neutral solution much less tannin will suffice to precipitate a certain quantity of alkaloid than in a corresponding acidulated one, or, in other words, a small amount of alkaloid will precipitate a comparatively large quantity of tannin, and at the same time the liquid will retain a considerable excess of tannin in solution.

Thus it becomes apparent that the acidulated fluid extract forms an excellent base for the preparation of so-called Decoctions and Infusions, which are easily prepared from it, of fine appearance and proper strength. This fluid extract can be produced by repercolation, or by the usual method. A very fine powder of the bark is applicable, but coarser grades are also serviceable. When the pharmacist powders the bark himself, it should not be mixed, but the coarser portion packed into the bottom of a cylindrical glass percolator, having its perforated diaphragm covered with tow or coarse cloth; the other grades are then successively superimposed with the finest at the top. The column should only be of medium height, and the percolation regulated at the outflow so as to proceed slowly. The proportion of acid which the writer gave, was 1 to 8, by measure—although less acid will answer, the mixture 1 to 16 is admissible. The alcohol and water being mixed in the proportion of 1 water to 3 of strong alcohol. The following process is conducted with one percolation by the usual method:

Take of Cinchona, in powder, from No. 50 to the finest grade,
16 troy ounces.
Chlorhydric Acid, sp. gr. 1.16, 1 to 2 fluid ounces.
Strong Alcohol,
Water. Each, sufficient.

Make a mixture of 3 measures of strong alcohol and 1 measure of water. Take 3 pints of this mixture and add to it the chlorhydric acid. Upon 4 troy ounces of the powder placed into a porcelain basin, pour 2 to 3 fluid ounces of the acid mixture, and unite the whole thoroughly with the aid of a pestle; add four troy ounces more of the powder, mix it well with the previous lot, and finally add the remainder, incorporating it all in an appropriate manner, adjust the moistened powder firmly in a cylindrical glass percolator, forming a moderately low column, and pour on the menstruum, regulating the current by the lower orifice at a slow rate; reserve the first 12 fluid ounces of the percolate, continuing the percolation by the addition of alcohol and water as above directed, until about 2½ pints more of percolate has been obtained; evaporate this at a moderate heat to 4 fluid ounces,and add to it, while yet warm, the reserved portion of the percolate, stirring the mixture a few moments until the separated residue has dissolved. The dense residue left after evaporation does not readily admit of measurement, but it rapidly dissolves in the reserved portion, especially if gently warmed. If the whole measures less than 16 fluid ounces, add strong alcohol until that measure is obtained.

CHALK MIXTURE.

BY R. ROTHER.

A noted British pharmacist once derisively observed that French pharmacy was summed up in the word "sugar," and that American pharmacy was analagously typified in the word "percolation." The "onward and upward" tendency of the cisatlantic branch of pharmacal art has however transcended upon a new phase, and as a progressive institution, American pharmacy has outgrown the epithet it wore with such becoming grace.

Being rife for a fresh cognomen, it is doubtful whether any word better than another could express it with more justice and greater force than "glycerin." The new Pharmacopœia is fairly saturated with it, and as glycerin is such an excellent antiseptic and preservative agent, it is to be feared that the new Pharmacopœia was intended "for keeps." Now, since the medical element was so prominent as one of its godfathers, and in whose hands it so deplorably aborted, we have the evident explanation why the modern pharmacal monstrosity was so carefully conserved and so ingeniously protected.

It should be expected that as the decennial phœnix was so effectively drenched in its baptismal font, the parties most concerned in its resurrection would have large experience in the application, and at least a general knowledge of the properties of glycerin. But what hobby ever existed, moreover an especial favorite of the medical ranks that was not speedily ridden to death? (for instance, the hypophosphites, carbolic acid, and chloral of sacred memory). The fact that the burdened object of medical favor should inevitably and often prematurely share the common doom, is readily predicted from the display of fanatical pertinacity and reckless indiscrimination with which it is beset. And what is the occasion for this ferocious pursuit? No occasion exists. It is merely the mongrel offspring of an overweening self-sufficiency and almost total ignorance of the ground invaded, whose devotees never do nor ever desire to comprehend the true import of any movement based on rational principles. Such motives go far to explain the miserable failure of the new Pharmacopœia, when its legitimate conservators abandoned it to the tender mercies of an alien institution, reared on the bulwarks of empiricism.

The proportion of glycerin in the new formula for "chalk mixture" is utterly inadequate for the purpose intended. Glycerin in this combination is also absolutely useless as well as inapplicable, because glycerin strictly speaking is not an antiseptic, its property to preserve decomposable organic matters when associated with it, is based on its affinity for water as opposed to the comparative volume of unincumbered aqueous fluid the decomposable body requires for its effective disruption under septic influence. Usually one-fifth of the whole volume is the minimum proportion in which glycerin can be counted on as effective. But although certain proportions will thoroughly obviate fermentative action, the formation of mould cannot be so perfectly controlled. A very viscid liquid, although containing the requisite proportion of glycerin, if stored away in a partially filled bottle and allowed to remain permanently corked, will, after some time, show signs of degeneration on the surface. If permitted to stand undisturbed under such conditions considerable mould or humus will accumulate, although no fermentation will become apparent. The same liquid, when frequently agitated during a like interval, or if portions of it are occasionally poured out, will however retain its quality unimpaired. The decomposition is here caused by the evaporation of water, which, condensing on the walls of the receptacle, flows down, and accumulating on the dense surface, dissolves portions of the decomposable material forming more dilute solutions, which rapidly pass into spontaneous decay. The perfect preservation of a body by means of glycerin does not in the remotest depend upon a relative proportion between the two, but solely upon the ratio the glycerin bears to the whole volume of solution. Furthermore, it is shown that glycerin is no antiseptic in the proper acceptation of the term, by the circumstance that septic action, when fully under progress, cannot be checked or moderated with glycerin, the momentum acquired by the metamorphosis now overpowers the affinity of glycerin for water. The proportion of glycerin in the new-fashioned chalk mixture is less than 1 to 17 by volume. It contains only two drachms of gum arabic in about 8½ fluid ounces, and more than twice this weight of glycerin is incorporated, solely to preserve that trifling quantity of gum.

This amount of glycerin would be more than ample to prevent dissociation, if the water were duly adjusted. It would undoubtedly remain perfectly stable if the volume of finished mixture was only about 3 fluid ounces; but a dilution to 3 times this extent is verily absurd.

In view of the impermanent character of the preparation it is difficult to understand why it still remains in this most undesirable and objectionable form. A chalk mixture which is spoiled, or even tainted, must necessarily be injurious, because the very agency is thereby transplanted into the alimentary channel, which it was the professed object of this preparation to modify or eradicate.

So mild a medicine as chalk mixture is specially indicated and applied in the treatment of children; therefore the plea does not hold good officinally to direct the preparation of 8½ fluid ounces at once, which quantity will evidently have to be held so long as to need the addition of preservatives. All indications in this connection testify that a practicable minimum should only be dispensed at a time, and that the pharmacist should invariably prepare it only just before the immediate demand. It is supposed that the officinal formula was intended to meet only cases of ordinary calls for domestic use, as on such occasions only would it become expedient to guard against possible injury by age.

However, such cases are in the minority. At least 9 times out of 10 the physician prescribes it, and as he almost invariably combines other remedies with it, which at that are mostly alcoholic, hence under such conditions the special introduction of a preservative is wholly uncalled for, because a very small proportion of alcohol will effectually preserve the mixture, consequently the pretended necessity of glycerin is actually obviated, and the doubtful action of glycerin effectually superseded by a reliable preservative.

The officinal direction for forming the mixture is also extremely faulty. It requires that chalk and gum be first mixed with the water, and that the other ingredients be finally added. Now, any operator with the least experience is aware of the difficulty attending a satisfactory union between powdered gum arabic and water alone; but here the wiseacres who contrived this formula on the writing desk instead of the dispensing table, actually possessed a valuable adjuvant to the manipulation which they disgracefully ignored. The dispenser is pleased for the sake of practical facility and convenience to have the prescriber add a viscid liquid to his combinations when they are composed of substances in powder form difficultly miscible with water. Because, with the aid of a syrupy liquid, as glycerin, or syrup of any kind, a proper impregnation and incorporation of the powder is easily effected. Therefore, if in the officinal manipulation the direction had been given to unite the gum with the glycerin first, or even first to mix the chalk and gum, and then rub it with the glycerin previously diluted with its volume of water, an advance upon the old process would have been apparent.

The writer, however, has found that the most thoroughly effective and practically advantageous method of bringing refractory powders (magnesium carbonate and a few others excepted) into mechanical union with water, consists in a preliminary mixture with alcohol strong or moderately dilute, and that this procedure can be carried out equally well without the intervention of a mortar and pestle, although rubbing the powders will become necessary when they are lumpy or aggregated in any way. Therefore, in most instances of this kind, when the prescription likewise contains alcoholic liquids or tinctures, the writer invariably utilizes these first before the addition of water or other fluid.

The main objection, however, which the writer entertains against the officinal chalk mixture, is relative to the liquid form. The writer has occasionally found inconsiderate pharmacists who kept even the old-fashioned chalk mixture in stock ready for use. However, the majority of pharmacists keep the mixed powders on hand containing the oil of cinnamon, and mix this simply with water in the proportion of one drachm to the fluid ounce, when called for. This speaks volumes for the intelligence of the general pharmacal body, as compared with that *able* revision committee who presume to represent the *beau ideal* of pharmacal art.

Now since the late revision presents a precedent, although not new, which can occasionally apply, the writer will copy it in this instance for several very potent reasons, and therefore suggests that a compound chalk powder be introduced which, aside from its general utility, will admirably form the basis for chalk mixture. Accordingly the officinal recipe for chalk mixture can be reduced to a minimum expression which simply indicates the proportion, and the improved and already generally popular formula would become thus:

Take of Compound Chalk powder, one drachm.
Water, one fluid ounce.

Mix the powder with the water gradually added, by trituration in a mortar.

The formula for compound chalk powder would then be as follows:

Take of Precipitated Carbonate of Calcium, 2 troy ounces.
Gum Arabic in fine powder,
Sugar in fine powder, each 1 troy ounce.
Oil of Cinnamon, 8 minims.

Rub the oil of cinnamon first with the sugar; add the carbonate of calcium and stir it well with the first mixture; then add the gum arabic; mix the whole thoroughly together, pass it through a No. 50 sieve, and again mix the powder well together.

It should be observed that in mixing various powders together, either of the same or different degrees of fineness, that sifting is often necessary, even if all the ingredients had been separately sifted before mixing. This operation is frequently of vital importance, because the preliminary act of mixing sometimes determines a peculiar adhesion among the particles which, if not again separated by means of a sieve, may cause an irregular uniformity in the mixture; and again, aside from this, it is required because accidental extraneous matters are nearly always present, and which can be readily removed with a sieve. But particular regard must be had for the fact that sifting itself deranges the uniformity, even though the powder before this final sifting process had been obtained as one grade only. Therefore, after this last sifting, the powder must again be well stirred together, because the finer particles pass through first, whilst the coarser remain to the last. This occasions a mound of powder which, although passed through the same sieve, is composed of undulating strata of different degrees of fineness, with the coarser on the top. Hence it will be seen that the method of mixing powders by means of a sieve, which is sometimes employed, does not effect an even mixture, and should therefore be systematically discouraged. Where large quantities of different ingredients are to be mixed, the operation is greatly abridged and facilitated by mixing only a convenient quantity of the whole in the relative proportion at a time. By means of the ordinary-sized mortars, large quantities of powder can be accurately and rapidly mixed without waste of labor, by resorting to a division of the material under hand.

REMARKS ON AN AQUEOUS FLUID EXTRACT OF SENNA.

BY ADOLF G. VOGELER.

There is in the Prussian pharmacopœia a preparation, species laxantes Saint Germain, composed of senna, potassium-bitartrate, fennel and elder-flowers. This tea is much in vogue amongst Germans, who administer it when a mild laxative is required, but more especially, and almost exclusively, is it taken by females, pregnant or during confinement. What makes this "St. Germain Thee" so popular is its gentle mode of operation, being void of any irritating properties, without the repulsiveness of castor-oil, which to a great number of persons is insuperable. But these qualities are only attained by a process peculiar to this preparation, namely: the senna leaves are exhausted with alcohol previous to being mixed with the other ingredients. The apparent object in view in employing alcohol is, to separate from the drug that peculiar resin soluble in alcohol, which is also partially soluble in boiling water but insoluble in cold water, and when administered causes intense griping.

Taking advantage of the knowledge regarding the solvents for this resinous body, some physicians, whenever they have occasion to prescribe senna, advise their patients *not* to use boiling water, but to prepare the "tea" simply by macerating the leaves in cold water for about ten hours; or, if the presence of aromatics is desired, first to steep those and add the senna to the cold infusion.

Being familiar with the above-mentioned method of extracting senna, the idea suggests itself to me that fluid extract could as well be made in this same way.

Accordingly, 16 troy ounces of senna in coarse powder was moistened with some water, packed moderately loose in a percolator, and after 24 hours maceration cold water was gradually poured on till it passed through nearly tasteless. After evaporating the whole, by means of a moderate heat, to the measure of one pint, 10 av. ounces of sugar were dissolved in the liquid, and concentration continued to make it measure 16 fluid ounces.

This I found to furnish an extract satisfactory in every respect. Its odor is most characteristic, color very dark; and under ordinary circumstances from two to three fluid drachms will operate on the bowels, from four to six drachms producing brisk cathartic action without any unpleasant sensation, and above all, its taste can be called almost agreeable. Every druggist is aware how often mothers demand a physic for their little ones; the child will not swallow that nasty castor-oil, nor does it like rhubarb, and they want us to "fix them up" "something nice." So far, I had always been at a loss to know what to dispense, but now I do not hesitate to give this fluid extract at once, and, so far as known, with general satisfaction.

Last December five pints of the extract were prepared, which kept well in a room of the ordinary temperature till the beginning of summer, when it began to show mould, which, however, after removal was prevented by an addition of one per cent. of sodium hyposulphite. Since the middle of August it has been slowly changing, and at present is in a state of active fermentation. If less sugar were used, and glycerine in the proportion of 1 to 8 were added, or if the latter alone was employed, as in the last edition of the pharmacopœia, for fluid extracts, this instability of the preparation might be obviated.

SOLUTION OF FERRIC CITRATE AND STRYCHNIA.

BY GEORGE F. DECKMAN.

The writer has found when strychnia is dissolved in the officinal solution of ferric citrate that strychnia citrate will separate in crystals. When the solution is prepared with the commercial ammonio-ferric citrate and strychnia, so as to contain half a troy ounce of the salt in the fluid ounce, then, especially in warm weather, the solution decomposes with precipitation of an insoluble oxysalt and the formation of an exuberant growth of mould. The first solution, when mixed with wines or tinctures of astringent vegetable principles, also deposits iron compounds in an insoluble form. The second solution, under similar influences, is apparently more stable, the color of the mixture deepens, but a precipitate rarely occurs. Both these solutions, possessing inherently objectionable pharmacal qualities, the writer, in view of the great convenience, and, in fact, actual necessity of such a solution in the dispensing department, felt called upon by numerous demands to furnish a solution of this combination which would possess a higher degree of permanence and be equally adaptable for general application.

This result was effected with unqualified success by employing the iron in condition of the green double citrate of triad iron and ammonium $(Fe'''(NH_4)_3 2(C_6H_5O_7))$. The strychnia readily unites with this salt in lasting combination. The solution corresponds in iron strength with the officinal solution of ferric citrate as 2 to 3. It is a magnificent emerald green, thin, syrupy liquid, absolutely permanent in hot or cold weather, and miscible with wines, tinctures, infusions, syrups, etc., without apparent decomposition. Three fluid ounces represent one troy ounce of normal ferric citrate, and rather more than 2 troy ounces of the green double salt. The writer deemed it expedient to add the strychnia only in the ratio of 1 to 96, or 5 grains to the troy ounce of normal ferric citrate, or three fluid ounces of the solution. Fifteen minims of the solution will then represent about ten grains of the green double salt, equal to 5 grains normal ferric citrate, and a trifle over 1-20 of a grain of strychnia. One pint and a half of the solution is prepared as follows:

Take of Strychnia, in powder, 40 grains.
Ammonium Carbonate (translucent), 5¼ troy ounces, or sufficient.
Citric Acid, in crystals, 5¾ troy ounces.
Sol. Ferric Citrate (officinal), 1 pint.
Water, 4 fluid ounces.

Pour the water upon the citric acid, and then add the ammonium carbonate, first broken up into medium sized fragments, until effervescence has ceased. (This operation is conducted without applying heat; it is greatly hastened by frequent agitation. During its progress, a considerable reduction of temperature takes place. The resulting solution of normal ammonium citrate measures about 9 fluid ounces). The ferric citrate solution is then evaporated to 15 fluid ounces, cooled, and poured in. The strychnia is now added, the mixture stirred a moment to dissolve this, and finally filtered. If desired, the solution can be evaporated with a careful and only moderate heat to the measure of a pint, or the mixed solutions are evaporated first and the strychnia is finally added. If the solution is evaporated to 12 fluid ounces, it becomes sufficiently concentrated to admit of being spread on glass or porcelain plates and dried. The evaporation must, however, be conducted at a low temperature and with constant stirring. If the temperature is brought near the boiling point in approaching the last stage, free ammonia is expelled. At this juncture the stirring must be well sustained, as a dense pellicle continuously forms. The dry salt is, however, unnecessary, as it can only be administered in solution, owing to its highly deliquescent character. Moreover, the dry salt thus obtained is no longer the original compound as it existed in the solution, but it is a double salt containing the ammonium base in the state of bimetallic citrate. The denser solution obtained by evaporating the first solution to two-thirds its volume is not free from this salt, since in moderately concentrated solution the normal ammonium citrate is easily decomposed by heat into free ammonia and bimetallic salt. In evaporating the solution of the normal double salt this decomposition can scarcely be prevented, as the evolution of ammonia augments as the solution becomes concentrated, and in the proportion as the ammonia is dissipated the acidity of the solution increases. From the concentrated solution containing the acid salt, the acid strychnia citrate crystallizes as readily as from the officinal ferric citrate solution as stated above. Even when again diluted to 24 fluid ounces after this evaporation, the strychnia will yet crystallize out. It is also evident that the acid strychnia citrate is insoluble in the acid ammonium salt when in concentrated solution, because the crystals, when separately treated with water, are easily and freely soluble. The strychnia does not appear to be precipitated from the dilute or concentrated solution when carbonated alkali is present in excess. A slight excess of ammonium carbonate only tinges the solution olive, but a considerable amount colors it red. Therefore, if the concentrated solution, after evaporation and cooling, be again neutralized with ammonium carbonate, the strychnia will remain in solution.

The writer prefers to generate the normal ammonium citrate by neutralizing citric acid with the ordinary tetrammonio-dihydric carbonate in the presence of a minimum of water. This method is infinitely superior to the usual one, by means of aqueous ammonia. The point of neutrality is more effectively reached, and the utmost concentration directly secured without the use of heat. The solution of ammonium citrate, if diluted with water to 11½ fluid ounces then contains over half a troy ounce to the fluid ounce, or exactly half a troy ounce of citric acid.

The writer calls attention to a number of typographical errors which occur in his recent papers. They are unimportant, however, and vitally considered, inconsequential. Yet the writer takes this occasion to point them out. In THE PHARMACIST for July, page 217, in line 13 from the top, read, "Fe''" for Fe'. In the same line also read, "$3O H_2$." for $3OH_2$. In THE PHARMACIST for September, on page 263, in line 17 from the top, read, "69" for 79; on page 278, in line 8 from the bottom, read, "pyrophosphate" for phyrophosphate; on page 279, in line 9 from the top, read, "becomes" for beomes, and in line 20 from the top, read, "K" for NH_4; and on page 281, in line 7 from the top, read, "potassio" for ammonio. The last two, however, were clerical errors by the writer.

OINTMENT.

BY HORATIO H. FRASER.

Take of Lard, 8 troy ounces.
Yellow Wax, 2 troy ounces.

Melt the wax, and add the lard gradually; then stir the mixture constantly while cooling.—*U. S.*

In the preparation of this ointment care should be taken to regulate the heat to which the ingredients are subjected, in order that they be not injured by too high a temperature; for the elegance, and sometimes a part of the usefulness, is impaired by the burnt smell and color of an ointment which has been heated too much. The wax should not be heated above 200° F., and the lard stirred in, the temperature being kept just high enough to preserve a liquid consistence until the lard has all been melted; then stirred until the pharmacist is sure the wax will not separate and form lumps through the ointment.

Ointment prepared in this manner has a slight yellow color, agreeable odor like yellow wax, a perfectly smooth feeling, a consistence like that of butter in cool weather, and a specific gravity a little lighter than water, varying with the briskness used in stirring, or the amount of air bubbles mixed into it. It should be kept in a cool place.

In the last pharmacopœia yellow wax was substituted for white wax, which has heretofore been used, to which substitution is due the difference in odor and color, and this last is the most important change in its physical appearance.

The new ointment has the quality of keeping longer without spoiling than the old, for while the old preparation would scarcely keep sweet a month during the warm season, the new has been known to preserve its pure odor and qualities unimpaired for more than a year, and this will recommend it to every careful pharmacist who has been annoyed by complaints from physicians that the ointments dispensed have spoiled before they were all used. And we do not wonder at such complaints, when we consider the importance of the use of ointment, and the various medicated ointments of which it forms the basis; and also that instead of forming a clean, healthy coating to a sore or wound and furnishing emollient properties to keep it soft, when rancid, it may irritate and prevent the parts from healing by reason of the compounds formed by the decomposition of its parts.

And again, although the melting point of yellow wax is lower than that of the white, the ointment has been noticed to keep a stiffer consistence, and is less liable to acquire the granular appearance noted in the old ointment during the summer season, a quality which will render unnecessary the habit some apothecaries have of substituting cerate for ointment during this season; and this has been used as an argument against the new ointment, that it cannot be so substituted, for, besides the difference in color, the same objection will hold good in regard to spoiling. But the choice of the two preparations should rest, not with the apothecary, but with the physician, who should be well enough informed concerning the pharmacopœia to understand what he is prescribing.

Some trouble has already been occasioned in stores by the difference in color between the new and old ointment, and some customers will not be convinced that the ointment dispensed to them is as good or better than what they have been in the habit of using. This involves a question of as much practical weight to druggists as their difference in qualities. For use in prescriptions it requires no thought at all to decide which to use; but for general dispensing, which, in the difference between the two would not involve much more than a question of trade, it would hardly be well what to advise; but the new ointment will ultimately come into general use, and it will perhaps save more trouble in the future if the ointment made with yellow wax is used for both prescription and general dispensing. A better understanding should exist between the pharmacist and physician with regard to the formulæ of the new pharmacopœia, for a few words from a family physician explaining the difference in their appearance and taste would save sometimes much trouble to the apothecary.

DETERMINATION OF POISONOUS VEGETABLE SUBSTANCES FOR FORENSIC INVESTIGATIONS.

The writer proposes chloroform as a very important and easily applicable test reagent for distinguishing between the various vegetable alkaloids. From solution in sulphuric acid the following substances are gradually withdrawn by repeated agitation with chloroform: Caffein, theobromin, colchicina, thebaina, papaverina, narcotina, and picrotoxin. From the same solution, after neutralizing with an alkali, chloroform withdraws immediately and completely in the cold strychnia, quinia, quinidia, cinchonia, caffein, theobromin, emetina, atropia, hyoscyamia, aconitia, veratria, physostygmina, narcotina, codeina, thebaina, nicotina, conia; and more slowly, brucia, colchicina, and papaverina; sabadillia only when warmed; and narceina in smaller quantities. Morphia and solanin are not withdrawn by chloroform from either an acid or alkaline solution.

In order to apply the alcohol test, the object is cut up, warmed to 75° C., heated with water containing sulphuric acid, and the solution digested at that temperature; the insoluble residue is pressed off, and repeatedly extracted with warm water. The acid extracts thus obtained are nearly neutralized by bicarbonate of sodium till only a slight acid reaction remains, and then evaporated in a water-bath to a thin syrup. This is mixed with four times its volume of 90 per cent. alcohol, and, after twenty-four hours, warmed to 40° or 50° C., filtered off, and the residue extracted with alcohol. From the alcoholic extract the alcohol is then completely distilled off. The residue of distillation is filtered, chloroform added, and then ammonia, till there is a distinct alkaline reaction, and the solution is then repeatedly agitated. The chloroform solution is then separated, and the alkaline fluid extracted with fresh portions of chloroform, until no residue is left on evaporating a small portion of the liquid. The alkaline fluid is in the meantime placed aside, and all the chloroform solutions several times agitated with fresh portions of water containing sulphuric acid. The chloroform is separated from the sulphuric water, the latter neutralized with ammonia, and then shaken again several times with chloroform. The chloroform solution now obtained is passed through a filter moistened with chloroform, washed with chloroform, and evaporated. The residue that remains behind is tested for all those alkaloids, which have been mentioned above as being extracted from an alkaline solution by chloroform. The alkaline aqueous fluid that was placed aside is treated with a fresh quantity of chloroform and dilute sulphuric acid till it becomes acid, again agitated with chloroform, and the chloroform separated and evaporated. Any picrotoxin that may be present and the remainder of the colchicina remain in the residue. On the now acid aqueous fluid is poured a stratum of amyl-alcohol, the solution made alkaline with ammonia and shaken, the amyl-alcohol taken off, filtered, and evaporated; all the morphia, digitalin and solanin, and the greater part of the remainder of the sabadillia, narceina and picrotoxin will be found in the solution; in the residue, after evaporation, a small quantity of the narcotina, caffein, papaverina, theobromin, digitalin, and colchicina. The first extract with chloroform is now evaporated, the residue repeatedly extracted with warm water containing sulphuric acid, the acid fluid neutralized with ammonia and agitated with chloroform. The remainder of the substances will remain, after evaporation of the chloroform.

Dr. Nowak also gives the following reactions resulting from the application of concentrated sulphuric acid:

Of the poisonous substance of which an analysis is required a small quantity is placed on a watch-glass, and one or two drops of chemically pure sulphuric acid added. The results obtained may classify the substances into six groups, as follows:

1. The substance remains colorless: quinia, cinchonia, morphia, strychnia, caffein, theobromin, codeina, (conia, nicotina,) atropia.
2. A yellow color of different shades ensues: quinidia, colchicina, emetina, narcotina, aconitia, picrotoxin, solanin, veratria, sabadillia.
3. The substance becomes rose-red: brucia.
4. It becomes first red, but is very soon dissolved with a yellow color: thebaina.
5. A violet color results: papaverina.
6. Various shades of brown are produced: delphinia, narceina, digitalin.

The paper includes also instructions for a variety of other useful tests to determine the presence of the particular alkaloids.—*Pharmaceutical Journal and Transactions.*

CORRESPONDENCE.

BALTIMORE, August 2d, 1873.

To the Editor of THE PHARMACIST:

Sir: Pharmacists spend much thought and a great deal of time in writing to increase the common stock of learning, but seem, in a great measure, to ignore themselves as individual men, entitled as fully to the enjoyment of life and health, and its pleasures, as any other class of business men. Our best and wealthiest men lead almost the lives of slaves. This is to be regretted, and needs to be reformed, and can be, easily, in the larger cities of our country, where intercourse in the colleges and associations renders concert of action, on all important subjects, so easily attained. It is true, we have little mercy ourselves, and less upon each other. Some of us have no sabbaths—no day of rest or recreation to build the exhausted energies of mind or body in—no hours of ease or freedom from care and perplexing thought and responsibilities which come to men of nearly all callings but our own.

Our lives are shortened in this way, and we often hear of the widows of pharmacists advertising for assistants to fill the place behind the counter of men whose lives might have been prolonged to a reasonable term under a better and more *humane* system. Why not desire and attain "length of days," as other men. This often inhuman and unnatural confinement has a baneful effect upon the mind and heart, in making men peevish, fretful, melancholy and misanthropic. It is a treat to see a really cheerful face among our strange, useful, but self-oppressed class, apt often to be mistaken for skin-dried mummies, did not *motion* remind us that they were, or should be, men. Only the shadow of the men left, sir, in but too many cases, if we will look at our weak brethren.

Parks, lawns, rivers, lakes, with the sports and delights connected and associated with each, are for other men to enjoy, not us—we must live and drudge and delve and find our pleasure in the consciousness that *they* enjoy these things, not us—only, only in imagination when we try to live over again what we lived and enjoyed on Saturdays and in vacations of school when boys. I hope, by these earnest words, to enlist the aid of your able journal, or some of its accomplished writers, in this good work for ourselves as individuals, and that the task of pointing out the means of liberalizing the ideas of the profession upon the subject of exercise, amusements and relaxation may fall to abler and more experienced hands than mine. If the field prove uninviting to others, I will not hesitate to make suggestions from time to time, which, if acted upon, will, I believe, carry smiles, cheerfulness, happiness and contentment where they seldom journey—to hearts and features of many sad and unhappy pharmacists.

Respectfully,
HUGH DOUGLAS McCABE, *Pharmacist.*

[There is a lesson to be learned in this overwork of the dispensing pharmacist; as a profession and trade we overstrain the nervous system with too much mental work, and must pay the penalty in the sudden moment of unguarded security. Brain-work, especially, is the great destroyer that drives its votaries to madness or the tomb. As a profession, "we work too hard and play too little;" will it not be well to heed the important lesson ere we drop in the harness—that we require more recreation and idleness, which is the inevitable and imperative need of humanity. What can there be more opportune for the relaxation of mind and body than the annual meeting of the American Pharmaceutical Association? The social feature, aside from the scientific interest of these gatherings, is of such a character, that, to those who have been in attendance at former meetings, it is looked forward to each season with eagerness for the anticipated pleasure of these annual reunions. To those who have not as yet participated we would advise to do so. We can promise them such enjoyment that they will not neglect to be regular attendants at these gatherings hereafter, if circumstances admit the absence from the post of duty.—EDITOR.]

CHICAGO, August 1st, 1873.

To the Editor of THE PHARMACIST:

Dear Sir: What is the formula for Hall's Solution of Strychnia? I have met with the following, and would be pleased to know which of the two is the correct one:

No. 1. Take of strychnia grain i,
Acetic acid q. s. to make solution,
then add water q. s. to make f ℥ j.

No. 2. Take of strychnia grains ij,
Comp: tincture of cardamom
Acetic acid aa f ʒ ss.
Alcohol,
Water aa f ʒ viiss.
Dissolve the strychnia in the acetic acid and alcohol, and add the others.

Yours, etc.,
J. H. WILSON.

[The formula containing the compound tincture of cardamom is known to us as Hall's, although the solution made after the formula No. 1 is generally dispensed when solution of strychnia is prescribed.—EDITOR.]

EDITORIAL.

"CINCHO-QUININE."

In glancing over the table of contents of our exchanges for the last six months, we have noticed the reproduction of an article headed, "What is Cincho-Quinine?" Being somewhat interested in this subject from a former exposure of this article, we have invariably turned to the page, and the following has always appeared as an editorial introductory to a long-winded article full of generalities in relation to the chemical and therapeutical properties of some of the constituents of cinchona bark. "'What is Cincho-Quinine?' This question is often asked by physicians who have not been made acquainted with the nature of this important agent, and therefore we republish the following article, which appeared in the *Boston Journal of Chemistry* for 1869, and which presents in a clear and explicit manner its nature and use." Then follows the article. We have been somewhat annoyed in seeing the republication of this article from month to month in the different medical journals, and laid the fault at the door of *Ignorance*, as we did not believe that editors of publications representing an honorable profession would be guilty of aiding quackery by filling the pages of their journals with such advertising "trash." We have on several occasions been tempted to call the attention of our medical colleagues to the fact that this same query, "What is Cincho-Quinine?" has been answered very satisfactorily by Wm. T. Wenzell, of San Francisco, Cal., who found this substance on examination nothing more or less than the cheap alkaloid *cinchonia*. This examination was published in the *Pacific Medical* *and Surgical Journal*, for the year 1870, and from this copied in many of the medical and pharmacal journals of that year. We thought that Cincho-Quinine had died with the same disease as Stearn's "Sweet Quinine." At last the mystery of all this editorial prostitution is cleared up, by the honesty of the editor of the *New York Medical Record*, who with the lantern of Diogenes throws the following light on the subject:

INDEPENDENT JOURNALISM.

"Few medical journals have been started without professing at the outset to be entirely free and untrammelled by any undue or unethical influences.

It is notorious, however, that there are few in this country which do not derive some pecuniary support from giving whatever influence they may possess, directly or indirectly, to some college or prominent physician or physicians; few which consider they can afford to refuse a profitable advertisement, when they can obtain it by bestowing upon its subject a laudatory editorial, or insert somehow in its columns a commendation of it.

From time to time we have noted this growing evil in medical journalism, and now desire to call the attention of the profession, and particularly of editors, to the advertisement of "Cincho-quinine," to be found in so many medical periodicals at the present time. A condition the proprietors of this article attach to its advertising is, that the journals with which they contract shall insert quite a lengthy extract from the *Boston Journal of Chemistry* (published by them), descriptive, etc., of the preparation. Of "Cincho-quinine" itself we have nothing to say, for or against; our desire is simply to protest, for the respectability and purity of the medical press, against *selling* their columns, with their advertising pages, to any person or for any purpose, good, bad, or indifferent."

Again "the almighty dollar" is at the bottom of all this puffing and blowing for an article which each editor should have known was an imposition on the profession, both in relation to composition and price.

Shame, gentlemen, you who ought to guard the purity, honesty and integrity of the profession, are the very ones who are aiding in undermining the standard. Where are the ethics of the medical profession? Echo answers, they are in print and can be found in the proceedings of our societies and associations, but do not form a part of our character.

O! tempora; O! mores.

THE AMERICAN PHARMACEUTICAL ASSOCIATION.

We give elsewhere a report of the twenty-first annual meeting of the American Pharmaceutical Association, held in the city of Richmond, Va., on the 16, 17, 18 and 19 of September, 1873. The attendance was unusually large from the East and South, the North and West being but sparingly represented. In point of pharmaceutical and social interest and importance this gathering was far above the average of former meetings. Some forty original papers were read, and nearly one hundred new names added to the list of members.

The courtesy and attention bestowed upon the members and their ladies was above all praise. The citizens and municipal officers vied with our brother pharmacists of Richmond in extending to us that open-handed hospitality so characteristic of the Old Dominion. The Hon. Mr. Keiley, the Mayor of Richmond, was especially happy in his eloquent welcome to the Association, and also in his patriotic speech in the famous "Dutch Gap Canal."

A happy occurrence was the receipt of a telegram, per Atlantic cable, bearing the fraternal greetings of the members of the British Pharmaceutical Conference, which was holding its annual meeting at Bradford, England, at the same time as that of the American Pharmaceutical Association at Richmond, Va. An answer was returned by the President in behalf of the Association, expressing fraternal greetings and sympathy to their British co-laborers. It is a pleasant feature to record this annual interchange of friendly expressions between these kindred organzations. This meeting at Richmond will long be remembered by all who participated, and we hope that much good may result.

The meetings of the teaching Colleges of Pharmacy, held in connection with that of the Association, was of an important character, but for lack of space we omit for the present a report of the proceedings.

The exhibition was one of average excellence, and taking it all together the meeting was a great success, introducing a new element to the Association, which we trust will continue to exert its influence and still further illustrate the truly national character of our aims and work.

OBITUARY.

Elias Durand, Esq., the eminent Pharmacist and Botanist, died on the 14th of August, at his late residence in the city of Philadelphia, after a long period of suffering. Mr. Durand was a native of France; born in the city of Mayence, on the 25th of January, 1794, he was consequently nearly eighty years old at the time of his death. His early life was passed in the city of his birth, where he received his education. At the age of 14 he commenced the study of pharmacy with M. Chevalier, with whom he remained four years. In 1812 he went to Paris and attended the lectures of Thenard, Gay-Lussac, Lefevre and Genault, and also a course on general literature, by Andrieux. Being commissioned *Pharmacien sous Aide*, he was examined by the Board, and shortly received notice from the Inspector-General of the Pharmaceutical Department of the Army that he had passed a most successful examination, and would be placed at the head of the list of applicants. He was soon ordered on duty, and participated in the battles of Leipsic, Lutzen, Hanan and others. At the downfall of Napoleon, and restoration of the Bourbons, Mr. Durand left his native country and came to the United States, where he arrived on July 1st,

1816. Soon after he took charge of a chemical laboratory in Philadelphia, where his health began to fail from the preparation of mercurial salts, and he found it necessary to give it up, and devoted himself to pharmacy. After spending some years in Baltimore, first as chief clerk and afterwards partner in Mr. Ducatel's drug store. In 1825 he returned to Philadelphia and established himself at the south-west corner of Sixth and Chestnut Streets, now the site of the *Ledger* building. He soon became known to all the prominent physicians, and obtained their entire confidence as a skillful and practical pharmacist. His rare industry, accuracy and close application to business secured him a large and remunerative patronage, and his noble qualities of mind and heart endeared him alike to the profession and the people.

BOOKS AND PAMPHLETS RECEIVED.

A Botanical Index to all Medicinal Plants, Barks, Roots, Seeds, and Flowers usually kept by druggists, in alphabetical order, with their officinal and common names. By ALLAN POLLOCK, Druggist. New edition revised and enlarged. New York. 1873. 8vo., pp. 137.

The Annual Journal of the Illinois State Dental Society, and joint Discussions of the Illinois and Iowa State Dental Societies, held at Rock Island, Ill., and Davenport, Iowa. Chicago, May, 1873. 8vo., pp. 197.

This volume embodies the transactions and discussions of the Illinois and Iowa Dental Societies for 1873. It can be obtained from Dr. C. R. E. Koch, Sec'y of the Illinois State Dental Society, 645 Wabash Ave., Chicago.

Report of the Columbia Hospital for Women and Lying-in Asylum, Washington, D. C. By J. HARRY THOMPSON, A.M., M.D., Surgeon-in-Chief. With an appendix. Washington: Government Printing Office, 1873.

Braithwaite's Retrospect of Practical Medicine and Surgery. Part lxvii. July. American edition. New York: W. A. Townsend, Publisher, 1873. 8vo., pp. 295.

The Half-Yearly Abstract of the Medical Sciences; being a Digest of British and Continental Medicine, and the Progress of Medicine and Collateral Sciences. July, 1873. Henry C. Lea, Philadelphia. 8vo., pp. 295.

Donations received for the library of the Chicago College of Pharmacy: from Thos. Braun, Chicago, back numbers of THE PHARMACIST; from Wm. O. Ensign, M. D., New Rutland, Illinois, back numbers of THE PHARMACIST.

Reviews of Books, List of Donations, and other items crowded out of this issue, will appear in our next.

THE PHARMACIST.

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CALCIUM BROMIDE.

BY R. ROTHER.

The formation of hypophosphorous acid in the preparation of the hypophosphites involves a considerable loss of phosphorus in the condition of phosphoric acid and gaseous phosphorus hydride. The execution of the process abounds in a variety of serious obstacles, so that the manufacture of the hypophosphites only becomes practicable on the larger scale where ample provision is made to meet all possible contingencies arising in its progress.

The evolution of spontaneously inflammable gas, coupled with the poisonous nature of the gaseous product, is alone sufficient to guard the casual operator against undertaking the precarious task, not to speak of the danger to be apprehended from a possible explosion of the final product during the evaporation of its solution.

Ordinary phosphorus, being at all times a fickle agent not susceptible of the usual treatment in the presence of unpredilect oxygen, is truly hazardous when subjected to a display of its powerful affinities with impunity.

To obviate the great loss which the regular process determines both in the generation of phosphoric oxide and trihydric phosphide, the writer proposed to substitute sulphur for that portion of the phosphorus which serves as the recipient in the removal of the surplus oxygen that was originally compounded as calcium oxide.

Whether this proposition can be practically carried out has not yet been established by experiment. But in view of the fact that no satisfactory method for the production of calcium bromide has thus far been published, the writer applied the principle in this case and found that the complete desideratum was supplied. When bromine is mixed with calcium carbonate and water a feeble action is excited, resulting in the expulsion of carbon dioxide and generation of calcium hypobromite. When, however, sulphur is added to the mixture, combination proceeds energetically; heat is produced and carbon dioxide is evolved with great activity. The resulting changes are highly complex and the products become intensely interesting. After the reaction has reached its quietus, with calcium carbonate and sulphur in excess, a colorless solution is obtained in which the elementary individuality of bromine has ceased to exist. The mixture filters with rapidity, and sulphur, calcium carbonate, sulphate, but principally sulphite, and probably oxysulphide, are by this operation left behind. The clear and colorless filtrate is neutral, it has a saline taste with a peculiar sulphury flavor strongly marked.

If this solution is allowed to stand a short time, sulphur begins to precipitate, but if it is heated, sulphur, together with a small amount of a peculiar sulphur calcium compound, is at once thrown down, simultaneously sulphurous oxide mixed with another gas is quite abundantly eliminated. The unknown gaseous product has the characteristic odor of molten sulphur, which is always noticeable when sulphur is about to assume the pasty allotropic condition when maintained at a certain temperature for a short time. This gas, even in small quantity, is most excessively irritating to the eyes. If the face be held over the hot solution a moment, the effect upon the eyes is quite as powerfully exerted as by means of bromine vapor. When the solution is acidified with chlorhydric acid before heat is applied no precipitate occurs, however, the evolution of gas remains the same.

By heating the solution in a test tube, either with or without chlorhydric acid, the liberated gas will readily extinguish the flame of a burning body placed in its current. Lead paper is not blackened by it, showing that no sulphydric acid is present.

After evaporating the solution to total dryness and keeping up the temperature a short time, the peculiar salt of calcium having the sulphury flavor is completely decomposed, if the residue is now treated with water and filtered, an insoluble residue remains equal in weight to about one-thirtieth of the bromine used. This residue is mainly calcium sulphate and free sulphur mixed with an undetermined insoluble calcium sulphur compound. The residue, when dried and heated to ignition, burns with a blue flame, evolving the odor of sulphurous oxide.

This phenomenon arises from the combustion of the free sulphur contained in the mixture. The remaining residue after this result is black and possesses a carbonaceous appearance. When subjected to further calcination at a red heat the blackness is dispelled and a purely white remnant is left. This consists principally of calcium sulphate, however a more soluble body now appears also to be present, but no effervescence is induced by contact with chlorhydric acid.

The solution of calcium bromide filtered from the sulphur precipitate may yet possess a faintly yellow tinge, and exhibit the peculiar sulphur odor characteristic of the bromides prepared from bromhydric acid generated by the action of dihydric sulphide on bromine in the presence of water. This color and odor is, however, totally abstracted by filtration through animal charcoal. The filtrate is then a perfectly colorless and odorless solution of calcium bromide, which, on evaporation to dryness, yields a white product of pure calcium bromide.

It is difficult to evaporate the solution to absolute dryness by a direct continuation of heat, because at last the dense residue, in a state of turbulent ebullition, throws particles of the salt in all directions with increasing vigor as the solution condenses. This is in a measure obviated by employing comparatively large vessels for the purpose. But the writer prefers to evaporate the solution under gentle ebullition until the dense crust forming over the surface embraces all but the narrow point where the boiling occurs. It is then removed from the sand bath over which the heating was conducted, and when congealed to a soft, colorless crystalline mass, immediately rubbed to powder in a chilled mortar and at once transferred to appropriate bottles and stopped securely. Owing to its deliquescent disposition it should not be exposed in the open air any longer than necessary, as it rapidly liquifies, particularly when warm.

The yield of salt from 4 troy ounces of bromine is nearly 6 troy ounces, which result indicates that this is not anhydrous salt, as it probably contains one or two equivalents of water.

The new method of granulating the salt by rapidly triturating the hot mass in a cold mortar is an admirable success. A uniform granular powder is obtained which is not immediately subject to the effects of atmospheric moisture, and consequently a perfectly dry product is at once obtained without the final application of heat.

The writer found that the bromine is rendered less volatile or in fact, non-volatile, at moderately elevated temperatures, and more energetic in its action upon the calcium carbonate when the sulphur is added in the proportion to form sulphur monobromide (S_2Br_2), than when the mixture is made with less sulphur in the proportion to produce the sulphur dibromide, (SBr_2). Nevertheless, the latter proportion has been adopted by the writer since it was observed that the sulphur assumed the position of a carrier. After once combining with the bromine and transmitting this to the calcium, it separated only to unite with a fresh portion and form anew the brown non-volatile and active monobromide. After all the bromine has combined with calcium, most of the original sulphur remains uncombined in the residue with the excess of the calcium carbonate.

The reaction in this process may be represented as follows, although it is not improbable that other combinations may also result:

$$2(S_2Br_2) + 3(Ca\ CO_3) = 2(CaBr_2) + CaS_2O_3 + S_2 + 3CO_2$$

or

$$2(S_2Br_2) + 3(CaCO_3) = 2(CaBr_2) + CaSO_3 + S_3 + 3CO_2$$

The first equation assumes that calcium hyposulphite is formed. This compound is very soluble in water and readily decomposes at elevated temperatures, moreover, free bromine decomposes it into calcium bromide, and tetrathionic acid. The bromhydric acid generated in the process would also decompose the calcium hyposulphite, and the liberated hyposulphurous acid would then instantly split up into free sulphur and sulphurous acid. But in a concentrated solution the calcium hyposulphite as well as the sulphite, generates a peculiar sulphobromic or bromosulphuric acid, which spontaneously decomposes with the separation of sulphur, the evolution of sulphurous oxide and production of calcium bromide in solution. The change is greatly accelerated by the application of heat.

The second equation indicates the formation of calcium sulphite, a fact which is substantiated by an investigation of the residue remaining after the extinction of the free bromine is complete. This residue, when treated with chlorhydric acid, yields a mixture of carbon dioxide and sulphurous oxide, and the acid solution then contains sulphur and calcium sulphate in suspension, it decolorizes iodine freely and abundantly, showing thereby that the residue was partly composed of calcium sulphite.

To judge from the residue which remains after the evaporation of the calcium bromide solution, it is evident that only a minute proportion of the sulphur compound existed in the solution. As but little calcium sulphate is simultaneously produced, and as the solution remains neutral, it may be presumed, with good reason, that the sulphur calcium compound contained equal equivalents of calcium and bromine.

This method is applicable for the production of bromides, and probably iodides of other bases besides calcium. It is advantageous to keep the sulphur at a minimum and add the bromine to the other ingredients by degrees.

From these observations the following practical and expeditious process is deduced:

Take of	Bromine	4 troy ounces.
	Calcium Carbonate (Precipitated)	4 troy ounces.
	Sulphur (Sublimed)	⅝ “ ounce.
	Animal Charcoal (Purified)	¼ “ “
	Water sufficient.	

Place the sulphur and calcium carbonate into an ordinary quart bottle, add one pint of water and finally the bromine, shake the mixture frequently, and, during the intervals of rest, set the bottle into the open air or in a good draft, leaving it unstopped. During the earlier part of this operation some of the bromine vapors will escape, but latterly the dark brown red combination of sulphur and bromine will cease to evolve bromine vapor, and then the mixture may be manipulated in any apartment without contaminating the respirable atmosphere with deleterious and irritating gas. When the bromine has all combined, effervescence ceased and the solution become colorless, strain off the insoluble residue, press it, and again mix it with 4 fluid ounces of water, press this mixture also and unite the strained liquid with the first solution, boil this down to about 8 fluid ounces and filter hot, to remove the deposited sulphur and calcium sulphate; or better, add to the mixed liquids a few drops of bromine, so as to insure only a barely perceptible excess, and then evaporate as before. This treatment will decompose any calcium hyposulphite that might probably be present much more effectively than the application of heat alone. The filtrate is now evaporated to dryness, however slackening the heat, when a dense pellicle begins to form; the heat upon the dry mass is then continued for 10 or 15 minutes, then altogether removed and the residue allowed to cool. Now pour on 6 fluid ounces of water, add the charcoal, heat nearly to boiling and filter; evaporate the filtrate until a heavy crust has formed over most of the surface, and boiling only continues within a narrow circular opening, then let the liquid congeal to a soft colorless mass, throw this while yet hot into a chilled mortar, rub it rapidly to powder and transfer this immediately to a well-stopped bottle.

AQUA CINNAMOMI.

BY F. W. REINHOLD, JR.

Maceration is by all means the most efficient and convenient course to pursue in the preparation of medicated waters. A perfect impregnation is invariably secured without introducing foreign matters or applying impracticable methods. The introduction of magnesia alba is so prejudicial to a pure product that for special purposes a water saturated by the interposition of this agency cannot be employed. But recently I was enabled to ascertain that waters impregnated by the aid of magnesia alba do not only not represent the original aromatic completely, but are sometimes materially changed in their total character. Heretofore no means were known by which we could determine whether the water had absorbed the oil as such or only a dissociated fragmentary portion of it. However, in the case of aqua cinnamomi, I have found that the product prepared by means of maceration is characteristically dissimilar to the water procured by the intervention of magnesia alba. The latter product has always a faint yellow tint, and not infrequently a rather decided greenish yellow color. The discoloration is not, however, restricted to this particular instance alone, as other aromatic material dissolved in water and filtered out of magnesia alba often colors the water through the action of some ingredient contained in the magnesia, which action is either referable to the hydrate of magnesia combined with the carbonate, or which is probably the most acceptable explanation at least in the majority of such occasions, that it is due to the presence of iron, this being a usual contamination of the commercial magnesian carbonate.

In aqua cinnamomi U. S., we possess a combination of these two causes, but the yellow color does not derive its existence from the presence of iron in solution as occurs in nearly every other colored solution clarified by this method. The oil is here evidently changed in part by the alkalinity of the hydrated oxide.

Aqua cinnamomi, prepared by maceration, is colorless, after standing a few days, but particularly on the approach of cold weather, this water separates quite an abundant crop of beautifully crystallized cinnamic acid, grouped together in lustrous needles, on long standing, especially in warm weather, they slowly wither and decay, as it were, leaving a grayish, flaky sediment, but in cold weather a profusion of new crystals again appears. This is one decided distinguishing characteristic between water prepared simply by maceration and such prepared with the use of the carbonate. If a drop of tincture of chloride of iron is placed in a graduated measure, and aqua cinnamomi is poured in, a dense, white turbidity is instantly produced, which augments by further addition of the water. By adding one or two fluid ounces of the water and letting the mixture stand 15 to 20 minutes, a bulky, yellowish white, flaky precipitate of cinnamate of peroxide of iron subsides which is readily soluble in muriatic acid or excess of the tincture. Now, if the water prepared with magnesia is treated in a similar manner, a faint flocculent yellowish red precipitate of hydrated oxide of iron is thrown down. Increased addition of water does not augment the turbidity, but rather dilutes and relieves it; on standing, the characteristic red flakes of the hydrate rapidly descend. This result informs us that the magnesia had completely removed the cinnamic acid as insoluble cinnamate of magnesia; and further, that the water was very perceptibly impregnated with the magnesian compound, as was shown by the precipitation of the iron solution.

From these interesting lessons we learn that the aqua cinnamomi produced by simple maceration and shaking of the oil with water, represents the oil of cinnamon in aqueous solution unchanged, and that magnesia alba determines a prompt and decided decomposition; we further derive an excellent distinguishing test for the waters prepared by the two processes.

If the water made by maceration is filtered out of magnesia alba, the filtrate is free from cinnamic acid, and gives no precipitate of cinnamate of iron when treated with tinctura ferri chloridi.

A FINE AROMA FOR ELIXIRS.

BY C. C. CUSTELAR.

According to the code of commerce and the consumers' concordant consent, it is considered strictly ethical and consistent with the conventionalities of trade, when vendors concentrate their continuous effort upon the conspicuous display of all the conceivable excellence of their commodities, which they constantly endeavor to convert into cash. Consequently we come to the candid conclusion that the concoctors of complex compounds must be conceded to be cute calculators in order to compete with the common and considerably more concentrated compositions of legally recognized commercial chemists. Compendious catalogues, and other comprehensive copy for compositors converted into printers' ink, compels the confiding community to congregate collectively contiguous to the confines of the conservatories where the confraternity of the convivial cup comfort themselves, and quickly quench the chronic craving, commonly called a concomitant consequence of *convalescing* constitutions, with an *elixir*. Confounded with consternation, the clean-handed and conscientious colaborators of the medical and pharmacal craft consummately condemn the conspiring connivance of certain closely connected cliques, who contemplate to catch, clutch and completely corner the scanty collections of currency clinging to the convulsed and contorted digits of the collapsed and cadaverous corporations, technically called clients. Confronted with conspirators on one hand, and countless cases of credulous *cobblers et al.*, captured by the collusion on the other, the conservators of correct canons cannot converge compactly to contest the critical and criminal counter-current of concealed corruption.

The pharmacal convention condignly concluded to counteract this crying confused conglomeration of conflicting interests, and after considerable cogitation consigned all compacts to the curs, and constructed an elixir companion supplement to the code, conforming critically and consistently with the consulted and calmly considered needs of the country. Concerted commendable colleagueal action will rapidly crowd out and completely crush the cabalistic tendencies, and render their recurrence categorically impossible.

With characteristic capacity for curious and empirical effects, compounders of elixirs cogently consolidate affects, which constitute the crowning consummation of their crafty course; and to convince the clinical cunctators, and cause them to comply with the behests of their covert creed, the capability to confirm adverse convictions is cleverly couched in concise terms, and the cloudy configuration concerning the clearness of the case is cunningly connected with the creations of correct chemical skill. Furthermore, these confederate cronies complacently consider, without mental compunction, that the consequential impression, causated by mere physical conditions, will compensate for the lack of curative components which their culpable cupidity continuously curtailed, and therefore collectively concur that an exquisite flavor can carefully cover the medicinal inferiority of their correspondingly villainous compounds.

Through co-operative proclivity the contributor in behalf of correct and conscientious ethical practice, feels called upon to conduce towards clearing the chaos, and having occasionally collated considerable casual experience in such connections, contemplated upon the course, and came to the comely conclusion that the Columbian continent, with its colossal cornucopia crammed to confusion with copious crops of the choicest indigenous products, could abundantly furnish the cream and the crystal of delightful aromas for our constant consumption. The coast of our Canaan (confronting the high seas) covered with orange groves, cordially contributes the coveted balmy congenial essence, contained in close contact with the greenish colored epidermis of the cortical coat of the coast orange.

Further comment upon this more convenient, less costly and countlessly superior flavor compared to the common Mediterranean orange is considered unnecessary. That this newly discovered aromatic caps the climax has been conclusively confirmed by the convictions of conversant connoisseurs. It is a commendably modest and retiring fruit, which contracts coherently within its covering confines the rich aroma, which cannot be comprehended or inferred by cursory or careful inspection, so closely is it cleft within that convex cutaneous crypt.

The contributor has constructed a compact, convenient, concentration of the cortical coat of the coast orange, which he has concluded to call "the concentrated depurated tincture of the cortical coat of the coast orange."

And it is conducted as follows: Take of "coast oranges" any convenient quantity; cut off the cortical covering and concise it into conchoidal comminuted clippings; commingle these with four times their quantity in weight, of cold water, and keep these in continual contact for two days, or if considered convenient, extract the bitterness through caloric without cooking, then collect the cortical parts over a colander, drain or coerce the water out, and continue the maceration in similar volume conditionally, for 7 days, with a composition composed of concentrated "cologne spirit" and water, equal quantities by measure. In conclusion, press and filter.

The contributor also compounds a simple elixir, as follows:

Take of Tincture of Coast Orange cuticle, as above, 2 fluid ounces.
Concentrated Cologne Spirit, 2 fluid ounces.
Syrup (concentrated), 3 fluid ounces.
Water (cold), 9 fluid ounces.

Combine these constituents.

The contributor has also corrected the Syrup of orange peel, as follows:

Take of Concentrated Tincture of Coast Orange covering, ½ fluid ounce
Syrup, sufficient to make a pint.

Mix.

These compounds contain an exquisite aroma, easily conveyed to other combinations. The volatile oil of coast orange rind is curiously soluble in dilute spirit or syrup, the mixture remaining clear and bright.

In conclusion, the contributor congratulates the colleagues that they can now completely cope with professional concoctors of elixirs, as these can no longer control the community of *medical* and pharmacal chemists, who have compounded the *universal elixir;* but which to be considered distinctly American, ought to contain the exquisite aroma of the cortical coat of the coast of orange.—*St. Augustine Fa.*

ON PAREIRA BRAVA.

BY DANIEL HANBURY, F. R. S.

A valuable article entitled as above was published in the Pharmaceutical Journal, Aug. 9, 1873, containing much of bibliographical and historical interest, (for which we refer the reader to the original,) besides a description of the true source of this drug. We extract the following:

"The botanical origin of the various stems and roots known as *Pareira Brava* is extremely obscure. By most writers, the drug is referred without question to *Cissampelos Pareria* Linn., a climbing plant of the order *Menispermaceae*, growing in the tropical regions of both the Old and New World."

"It is known in Brazil as *Butua*, or *Pareira Brava legitima*, and *Butinha*, or *Pareira Brava minda*, (literally, small *Pareira Brava*,) and derived from *Chondodendron tomentosum* of Ruiz et Pavon. It is the *Cocculus Chondodendron* of DeCandolle (Prod. I : 98), and has been figured as *Cocculus*(?) *platyphylla*, by Auguste de St. Hilaire, and by Eichler as *Botryopsis platyphylla* Miers."

Chondodendron tomentosum has been found in various parts of Brazil, where it is known as *Butua* and *Abutua*. Its raceme of large, oval berries, exactly like a bunch of grapes, is another evidence, that it is the plant which the old Portuguese colonists called *Pareira Brava* or *Wild Vine*." "In Portuguese the word is written *Parreira*, and signifies a vine that grows against a wall or over an arbor. *Párra* is a vine-leaf." "Neither the fruit nor the foliage of Cissampelos Pareira have anything about them suggestive of a grape vine.

The root of *Chondodendron* cannot be confounded with the stem, which is woody and fibrous and of a different structure." "It is a tortuous, branching root, wrinkled longitudinally and having transverse fissures, constrictions, or ridges, externally of a blackish-brown, and light yellowish-brown within." "The recent root is gorged with juices so that under the penknife it cuts more like a very hard fat or wax than as a fibrous wood. In transverse section it does not display zones of the same regular and beautiful definition that one sees in ordinary Pareira Brava. In the root of Chondodendron there is a large, well-marked central column, composed of wedges, diverging from a common axis, around which are arranged a few concentric rings intersected by wedge-shaped rays which are often irregular, scattered and indistinct. The axis is often concentric.

"In *Cissampelos Pareira* the root and stem are nearly alike in structure, and in transverse section show no concentric rings."

"The Pareira Brava, of English commerce, is mostly of larger size than the root of *Chondodendron*, and is a much more woody substance. Its internal structure, which is familiar to most druggists, is very remarkable, consisting of a series of layers which are often developed exclusively in one direction. Nothing is known of the botanical of this drug, beyond the fact that the structure of the wood is that of the order of *Menispermaceae*.

Of late years even this sort has become rare, and its place has been taken by a drug completely void of medicinal power. This latter consists of cylindrical woody truncheons which have an internal structure not very diverse from that referred to below, though generally less excentric, with always a distinct central pith. The wood is tasteless, and often seems to have been injured by damp. It should be rigidly excluded from pharmaceutical use.

Several other sorts of Pareira Brava are known, at least in South America. One, of which there is a parcel now in the London market, is remarkable for its large size, and for being internally of a fine yellow As it is also very bitter, it probably contains berberine.

Another sort is derived from *Abuta rufescens* Aublet, a well-marked plant growing in Guiana and North Brazil. Specimens of a thick, woody root, *Abutua grande*, or *Pareira Brava grande*, and attributed to this species have been sent to me; they exhibit numerous concentric layers tarversed by very distinct, dark medullary rays, the inter-radial spaces being white, and rich in starch. It is apparently a well-marked root, and one I have not seen in commerce.

In conclusion, I strongly advocate returning to the use of the root of *Chondodendron*, which is the drug on which the reputation of Pareira Brava was originally founded.

In Brazil this root is regarded as the legitimate sort, and is still held in the highest esteem."

"There can be no doubt that it would become plentiful if the demand should arise, and that it would advantageously replace the worthless kind now found in the drug trade."

THE SEPARATION OF THE MIXED ALKALOIDS FROM CINCHONA BARKS.

BY DR. J. E. DE VRIJ.

Recently a London firm of manufacturing chemists, who had read with interest my paper on cinchona alkaloids, published in this Journal, applied to me to inform them "by what means I separate the mixed alkaloids from the dry bark." I therefore suppose it may perhaps be useful also for other readers of this Journal if I publish my actual method—which has been published in a Dutch periodical in 1871—also in this Journal. 20 grammes of powdered and sifted bark, dried at 100°C., are mixed with milk of lime, made of 5 grammes of dry slaked lime and 50 grammes of water. This mixture is slowly dried, and when entirely dry, heated in a flask with 200 cubic centimetres of very strong spirit (the strongest possible) till it boils. After cooling and subsiding, the clear liquid is poured on a filter large enough to contain all the bark, but not larger than is strictly necessary, (a filter of 15 centimetres diameter is sufficient). The residue in the flask is now mixed again with 100 cubic centimetres of spirit, this mixture well shaken, and poured on the filter. When all the liquid has passed through the filter, the powder remaining on the filter is washed with 100 cubic centimetres of alcohol, so that in the whole, 400 cubic centimetres of alcohol are used for 20 grammes of bark. The united liquors are now slightly acidulated with weak sulphuric acid, whereby a precipitate of sulphate of lime is formed. After this has subsided, the greater part of the liquid can be poured off, the rest being filtered through a small filter. The clear liquid is now distilled to obtain the greater part of the spirit used, and the remaining liquid poured into a capsule, to which is added the spirit and the water by which the distilling apparatus is subsequently washed. The capsule is now heated on a water-bath till all the spirit has been expelled, and the remaining liquor which contains all the alkaloids in the form of acid sulphates, is, after cooling, filtered through a small filter. On the filter remains a mixture of quinovic acid and fatty substances, which must be washed repeatedly with water slightly acidulated by sulphuric acid till caustic soda no longer produces any turbidity in the passing liquid. The filtrate is now reduced to a small volume by heating on a water-bath, and while *still warm* precipitated by a slight excess of caustic soda. The benefit derived from this kind of precipitation is that the alkaloids precipitated from a warm solution are less voluminous, and can, therefore, more easily be washed. The drawback, however, is that the alkaloids from some barks melt under these circumstances, which drawback can, however, easily be rectified by powdering carefully the alkaloids after the cooling of the liquor, and collecting this powder on a small filter. After washing with the smallest possible quantity of distilled water, sufficient to remove the soda salt but not to dissolve quinine, the filter is laid upon blotting paper, and this so often renewed till the mixed alkaloids can easily be separated from the filter without adhering to it, which can be done before they are entirely dry, but requires some practice. They are then heated in a weighed capsule on the water-bath, till repeated weighings show that the weight remains constant. The observed weight multiplied by five gives the amount of mixed alkaloids in 100 parts of bark.

The amount of quinovic acid can be ascertained in the meantime, if the mixture of quinovic acid and fatty substances be treated with a weak solution of caustic soda, by which a great part of this mixture is dissolved. If to this turbid solution a slight excess of chloride of calcium is added, only the quinovate of lime remains in solution and can be obtained in the shape of a clear slightly-colored liquid by simple filtration. If this clear liquid be acidulated by hydrochloric acid, the quinovic acid is precipitated in the shape of a voluminous jelly. As the amount of quinovic acid is generally very small, its quantity can rarely be ascertained with accuracy, unless the amount of bark be not under 40 grammes. As I generally make two analyses of 20 grammes of bark, I combine the mixture of quinovic acid, etc., of the two filters for the determination of the quinovic acid. If the two analyses are carefully performed under the *same* circumstances, the results differ only very slightly, as may be seen in my analysis of some Jamaica barks, published on p. 121 of this Journal.

The Hague, 17th September, 1873.

—*London Pharm. Journal.*

ANTIDOTE TO PHENIC ACID.

The poisonous effects of phenic acid are due to the acid itself, and not to the alterations to which it is subject.

Mr. Husemann has proved, by numerous experiments, that the alkalies and alkaline earths are true antidotes to this acid, while the fat oils, glycerine, &c., are entirely without effect.

In cases of poisoning, it is necessary to use these antidotes in large excess and in solution, the saccharate of lime being employed successfully. This is obtained, as is known, by dissolving 16 parts of sugar in 40 of distilled water, and adding 5 parts of caustic lime. Digest for three days, stirring from time to time, filter and evaporate to dryness. The product thus obtained constitutes the saccharate of lime; it dissolves easily in water.—*Journ. de Pharm. et de Chim., Sept.* 1873.

A FEW PRACTICAL HINTS.

Liq. Magnes. Citratis.—If, in preparing this, simple syrup be used instead of syrup of citric acid or lemon, and the oil of lemon be first rubbed up with the citric acid, and the solution be divided among the bottles, and the syrup last added, pouring it in gradually, it will at once sink to the bottom. Then the bicarbonate of potassa may be added; it will at once sink through the solution and become entangled, as it were, with the syrup, and remain undissolved until well agitated, which can be done at the moment of dispensing. This avoids all danger of blowing out the corks, and obviates all necessity of hurry, and the preparation may be kept all tied up, ready for sale, without undergoing the change it invariably does when kept all dissolved.

Oil of Lemon.—Add at once 2 ounces of water to each pound and shake well; let stand; the mucilaginous matter with which the oil abounds, and which hastens its change to the terebinthinate state, sinks to the bottom with the water, and the oil can be kept unchanged and of fine odor for years.

Extract of Vanilla.—If the beans be cut up fine, and macerated for five days, with one-half the quantity of the alcohol to be used, and then filtered, the beans left on the filter will be found to be completely dehydrated and deprived of their tenacious qualities. They can be readily rubbed to a fine powder, ready for percolation with the remaining glycerin, alcohol, and water necessary. The hint is valuable, as it does away with sugar, sand, and all other powdering devices.

Castor Oil—A New Way of Dispensing this Nauseous Medicine, Making a Palatable Drink thereof.—In the bottom of a tumbler pour about six drachms of syrup of sarsaparilla, add a small quantity (about 20 grains) of bicarbonate of soda, stir with a spatula, add about a teaspoonful of a saturated solution of tartaric acid (always kept ready), stir well; this makes a heavy viscid froth. Then pour down the side of the tumbler, so as to sink to the bottom and not mix with the froth, about an ounce of water; then add the oil. The whole is to be drank without agitation. The water is at the bottom, the oil at the center. and the froth on top. This is certainly tasteless, and the oil is all taken, as, after dispensing, the tumbler can be washed out clean with simple water, showing that no grease adheres to the sides of the glass, This *modus operandi* is rather long to describe, but it is done in a "jiffy."

H. TREVERTON BOND, M. D.

Phila., Pa., Sept., 1873.—*Druggist Circular.*

PREPARATION OF ABSINTHE.

Liquors of wormwood are divided at present into five different kinds: Absinthe créme, A. ordinaire, A. demi-fine, A. fine, and A. suisse. The first is only used at table. They are prepared either by distillation, or in the cold way, by means of the wormwood essence. The fresh plants cut are macerated previous to distillation, for 24 hours in a mixture of 15 litr. alcohol, of 85°, and 15 litr. of water; 15 litres are drawn off, to which are added 4 litr. of alcohol, of 80°, and 45 litr. of water. Color is given by some liquor-coloring, or by maceration with wormwood herb. The formula for "Absinthe fine" is as follows:

By Distillation.	
Absinth. vulg	2500
" pontic	500
Herba Hysopi	
" Melliss citr., of each	1000
Sem. Anisi v. (green)	5000
" " stell	1000
" Foeniculi	2000
" Coriandri	1000
Alcohol of 85°	80 litres.
Aq. Com	20 "

By Mixture.	
Essence de grande absinthe	30
" de petit "	10
" d'hysope	
" de melisse, of each	6
" d'anis	
" de badiane, of each	100
" de fenouil	30
" de coriandre	2
Alcohol of 85°	80 litres.
Aq, com	20 "

The different kinds of absinthe vary considerably among each other in their quantity of alcohol and oil of wormwood. A small glass, (30 ll.) contains:

	Alcohol.	*Various Oils.*	*Oil of Wormwood.*
Absinthe Ordinaire	14.3	0.030	0.005
" demi-fine	15	0.046	0.010
" fine	20.4	0.085	0.010
" suisse	24.2	0.085	0.010

—*Neues Jahrbuch fuer Pharmacie.*

PRESERVATION OF ALBUMIN FOR PHOTOGRAPHIC PURPOSES.

BY W. GAY.

A number of eggs are opened, the albumin carefully separated into a porcelain capsule, kept only for this purpose; no water is added; the albumin beaten into a stiff foam, and then allowed to settle. After this the liquid is poured into a shallow dish, covered to exclude the dust, and set aside. After some time, perhaps a day, it will be found completely dried up, hard. Thus it is kept on hand. If some is wanted, a very little water is added, rubbed about on it with the finger, till it is enough, diluted with the requisite quantity of water, and filtered through a fine sponge. In this way albumin may be kept serviceable for a very long time; it becomes even better by age, is much clearer than fresh albumin, and produces, in consequence, better negatives.—*Neues Jahrbuch fuer Pharmacie.*

LOSS OF DRUGS IN POWDERING.

The following table, showing the average losses in weight, in powdering, will probably be found interesting and useful for reference.

It exhibits the results from a number of trials of each article, covering a period of several years, and was prepared at one of the drug mills of this city. These losses as will be readily understood, vary as the dryness of the article varies.

	PER CENT.
Acid, Tartaric,	¾ to 1
Aconite Root	2 to 5
Allspice	1½
Aloes, cape,	6 to 7½
Socotrine	8 to 10
Alum	½ to 1
Argols, Red,	2 to 3
" White,	¼ to ¾ of 1
Assafœtida	9 to 11
Barberry Bark	3
Bayberry Bark	4
Bean of St. Ignatius	1 to 3
Benzoin	1
Black Lead	¼ to ¾ of 1
Blood Root	3 to 4
Blue Vitrol	2
Bole, Armenian,	1
Borax	¾ of 1
Buchu	3 to 4
Butternut Bark	3½
Calisaya Bark	3 to 5
Canella Alba Bark	3
Cantharides, powdered	2 to 3
Capsicum	7 to 9
Cassia	3
Castile Soap	23 to 25
Cloves	3
Cochineal	½ to 1
Colocynth Apple, powdered,	4 to 5½
Copperas, when dried,	7
Corrosive Sublimate	1¼
Cream of Tartar	¼ to ¾ of 1
Cubebs	1½
Elm Bark	3 to 4
Ergot	2 to 3
Euphorbium	½ to 1
Fenugreek	3 to 3½
Flaxseed	1 to 2
Gamboge	3 to 4
Gentian Root	6 to 13
Ginger, African,	3
" Jamaica	3
Gum Arabic	4
Indigo	2
Ipecacuanha	3 to 4
Jalap	9 to 10
Lac Dye	2
Liquorice Root	
chipped and bruised	3 to 4
powdered	10 to 12
Liquorice, stick	10
Mace	1
Mandrake	4 to 5
Manganese, Black Oxide	1½
Mustard	6 to 7
Myrrh	8 to 10
Nut Galls	4
Nux Vomica	4 to 5
Opium	18
Orange Peel	3 to 5
Orris Root, powdered,	6 to 8
Pepper, Black,	2½
Poplar Bark	1
Potassa Prussiate	1½
Prickly Ash Bark	1 to 2
Pumice Stone	2½
Rhubarb, powdered,	3 to 4
Sal Ammoniac	1
Sarsaparilla—	
Chipped and bruised,	4 to 5
Finely Ground	10 to 13
Scammony	4 to 5
Senna	3 to 4
Shellac	2 to 3
Snakeroot, Black,	3 to 4
Squills	3 to 5
Sulphur	1½
Valerian	3 to 5
Vanilla Beans	4 to 5
Wild Cherry Bark	3 to 5

—*Philadelphia Drug Exchange.*

PHARMACEUTICAL PROGRESS.

As there is such a malady as chronic elixir on the brain abroad in the country, and a prospect of its never being checked as long as there is a root, herb or leaf left in the ground or on top of the ground, I enclose you the following in advance, for some of your querists may want it, and 'twill save you the trouble of looking it up.

ELIXIR OF BENZINE, ASSAFŒTIDA AND SMART-WEED.

℞.	Smart-weed, benzine and assafœtida, in fine powder of each,	A handful.
	Sweetened water,	
	Sour cider, of each,	2 cupfuls.

Mix, and season to suit the taste.

I would further state that the originator of the above died in the effort, but that I can furnish you any amount just as good.

M. W. BALLARD.

P. S.—I have also a formula for elixir of Wahoo, watermelon and sorghum, with phosphate of pumpkin seeds; and several others not less desirable.

[We should not be much surprised if the writer of the above is inclined to be both facetious and ironical; and it is possible that there may be some grounds for both the one and the other.—Ed. D. C.]—*Druggists' Circular.*

FROSTING OF GLASS.

BY P. WEISKOPF.

Fluor spar, rubbed to the finest flour, is put into a dish the inner side of which is covered with paraffine, and made rapidly into a thin paste with concentrated sulphuric acid, using the necessary precautions. This is transferred by means of a pencil of metallic lead to those portions of the glass which are to be frosted. In this manner, with a little exercise, even fine drawings may be produced on polished glass. To frost whole surfaces, they are covered with the paste to about 0.5 ctmtr. high. Small and round objects are covered entirely with it. As soon as one part of the drawing is done, it is sprinkled with clean, powdered fluor spar, this being repeated till the whole design is finished. The objects are then placed into an iron pot or kettle, the bottom of which is covered with plaster of Paris or precipitated chalk, and gently heated for two hours, which must be done under a chimney with a good draught, in order to get rid of the superfluous fluoric acid. The end of the operation is known when the cover of the objects is completely changed into gypsum and peeling off easily and perfectly. The plates are then washed with a brush in dilute solution of hydrate of potassa, and after that several times in water, when the covered portions will appear clean and intensely frosted. This process is used on a large scale for frosting ornamental objects of glass with perfect success. The author succeeded in producing frostings of 2 mmtr. depth by several repetitions of the procedure. Doubtless the finest designs, drawn on a resinous ground, may be frosted in this manner; but then the objects dare not be heated, and the operation requires more time.—*Pharm. Centralhalle, No.* 31, 1873.

MIXTURES FOR SIGNAL-FIREWORKS.

(ENGLISH PATENT.)

To obtain distinctly colored lights for signal-fireworks, the following formulæ are given:

FOR WHITE LIGHT.

Take	100	parts	Chlorate of Potassa.
	10	"	Sulphuret of Antimony.
	15	"	Boiled Linseed Oil.

FOR RED LIGHT.

Take	50	parts	Chlorate of Potassa.
	50	"	Nitrate of Strontia.
	5	"	Charcoal.

and so much boiled linseed-oil as is requisite to knead the mass.

FOR GREEN LIGHT.

Take	50	parts	Chlorate of Potassa.
	50	"	Nitrate of Baryta.
	5	"	Charcoal,

and linseed-oil as before.—*Pharm. Centralhalle, No.* 31, 1873.

KARAKIN.

W. Skey has isolated the bitter, poisonous substance of the kernels of the karaka berry, which is derived from a tree indigenous to New Zealand. The kernels were crushed, and exhausted by successive portions of cold water for two days, until the remaining meal had lost all bitter taste. The liquor was them mixed with acetic acid to get rid of cassein and emulsin, filtered, and the filtrate shaken with animal charcoal till the bitter taste disappeared. The charcoal was then exhausted with boiling alcohol and the extract set aside to rest in a cool place, when after two or three days, fine crystals grouped in rays, separated from the solution.

The substance so separated, called by the author "Karakin," tastes very bitter, shows a white pearly lustre, is slightly acid to litmus-paper, and melts at 100° C. With hot sulphuric acid it becomes dark rose-red; is in cold water little, but in boiling pretty easily soluble, also in alcohol, muriatic acid, acetic acid, ammonia and hydrate of potassa; entirely insoluble in ether and chloroform.

Karakin contains no nitrogen, and gives with tannic acid and iodohydrargyrate of potassium (Iod-kali-quicksilver), no precipitate. It is therefore no alkaloid. Alkaline solution of sulphate of copper produces a green precipitate, and it is consequently in this, similar to digitalin. The precipitates of both differ, however, in this, that the one from digitalin remains unaltered when heated to nearly 100°, while the karakin precipitate, under these circumstances, reduces the salt to a sub-oxyde. But when digitalin is treated with an acid previous to exposing it to the test of the alkaline solution of sulphate of copper, then the resulting precipitate, on being heated to about 150°, will reduce the copper-salt.—*Neues Jahrb. fuer Pharm., May and June*, 1873.

COLLATED PRACTICAL RECEIPTS.

Sapo Fellitus (Ox-Gall Soap—Gallseife).—

Take of Ox-gall inspissated, 8 parts.
Soft Soap, 60 parts.
Sugar in powder, 12 parts.
Venice Turpentine,
Honey. Of each 4 parts.
Strong Water of Ammonia, 2 parts.

Mix.

Another formula is;

Take of Soap, in powder, 16 parts.
Ox-gall, inspissated, 8 parts.
Venice Turpentine, 1 part.

Mix and make into a mass. Ox-gall Soap is sometimes called for. It is generally used for laundry purposes.

Oleum Cadinum (Oil of Cade).—

The article generally found in the market under this name is a mixture of Pine-tar and Oil of Juniper, and not the oil obtained from Juniper-tar. The following is the formula used in the trade:

Take of Pine-tar, 10 parts.
Oil of Juniper,
Olive Oil. Of each 40 parts.
Gum Benzoin, 1 part.

Melt them together by the aid of gentle heat, and when cold, strain through muslin.

Erasive Fluid.—

Take of Benzine, refined, 8 pints.
Alcohol, 95 per cent., 1 pint.
Strong Water of Ammonia, 1 oz.

Mix. This is an excellent eraser for removing from all kinds of fabrics, stains produced by grease, wax, paint, etc., etc.

The inquiry is frequently made by customers, what removes mildew? This may be accomplished by soaping the spots, and while wet, covering them with fine chalk, scraped to a powder and well rubbed in. —(*From Jour. of Applied Chemistry.*)

Oleum Hyoscyami Coctum.—

Take of Hyoscyamus Leaves (cut small), 2 parts.

Moisten with—

Strong Alcohol, 1 part.

Place in closed vessel and let stand an hour. Then add—

Olive Oil, 12 parts.

Apply gentle heat, with constant stirring, until all the alcohol has been evaporated, and then filter while still warm through paper.

Oleum Absinthii, Oleum Belladonnæ, and Oleum Conii are prepared in this same manner.

These oils are frequently prescribed by German physicians, and a more active and desirable preparation is produced by the use of the solid extract, as follows:

Take of Alcoholic Extract (solid), 1 part.
Alcohol, 1 part.
Olive Oil, 22 parts.

Mix the extract with the alcohol, and when dissolved, add the olive oil.

SUBSTITUTE FOR BOTTLE-WAX (FRENCH PATENT.)

A mixture is prepared of: Gypsum (plaster of Paris) 400 grm., white English cement 600 grm., chalk 300 grm., dextrin 200 grm., ochre or other coloring material to produce the color desired, q.s., alcohol varnish 5 litres. The necks of the bottles are dipped into this mixture and allowed to dry. It presents several advantages; common sealing-wax can only be used with heat, sticks to the fingers, possesses a bad odor, and becomes liquid in a more or less high temperature.—*Neues Jahrb. d. Pharmacie, Jan.*, 1873.

PATENT MEDICINE VENDORS.

An action for libel was lately brought against the *American Agriculturist* by a Dr. Ryan, a patent medicine vendor. Judge Brady, of New York, before whom the case was tried, gave the following opinion:

1. "A medicine that claims to be an antidote, but is not, is calculated to deceive, and is a fraud."

2. "The seller of a drug or medicine, who vends it with an unqualified statement of its efficiency, must take the consequences if his representations be untrue."

3. "That men should be held to a strict accountability who attempt to practice on the credulity of the afflicted."

We fully concur in this interpretation of the law, that any man who buys a nostrum advertised to cure a certain disease, and is made worse, or is not cured, can bring suit and recover damages from the vendor of said nostrum. We trust that those injured, or not cured, will apply for damages in such numbers as to frighten these unprincipled men into propriety.—*Nashville Journal of Medicine and Surgery. From Canada Lancet.*

AMERICAN PHARMACEUTICAL ASSOCIATION.

LIST OF QUERIES ACCEPTED AND TO BE REPORTED UPON AT THE NEXT ANNUAL MEETING.

1. American Extract of Licorice is regarded, by a recent investigator, as of superior quality, and is found to yield a large percentage to water.

Query:—Does not such extract contain an admixture of gum or dextrine? Accepted by Adolph W. Miller, of Philadelphia.

2. Powdered Blue Mass. What is an easy and convenient mode of preparing a mercurial powder to fully represent the officinal Blue Pills? Accepted by John F. Hancock, of Baltimore.

3. Medicated Waters. How does the water prepared from the oils with Carbonate of Magnesium compare with those distilled from the fresh ingredients? Accepted by N. Hynson Jennings, of Baltimore.

4. Recent examinations of Commercial Bismuth preparations in Europe have determined the presence of appreciable quantities of silver in them.

Query:—Do the bismuth preparations in this country contain any silver, and are they free from arsenic? Accepted by Joseph H. Feemster, of Cincinnati.

5. What is the solubility of commercial Sulphate of Morphia in water? Accepted by M. L. M. Peixotto, of New York.

6. Commercial Sulphate of Potassium in the European markets is stated to contain a large percentage of Sulphate of Sodium. Is this true of the sulphate found in the American markets? Accepted by P. W. Bedford, of New York.

7. What is Cincho-quinine? Referred to Albert E. Ebert, of Chicago.

8. What is Bromo-chloralum? Referred to S. S. Garrigues, of East Saginaw, Mich.

9. An Essay on the Botanical and Chemical Character of American Nut-galls. Referred to E. S. Wayne, of Cincinnati, Ohio.

10. Oleate of Mercury has lately occupied the attention of pharmacists, and many processes for its preparation have been proposed.

Query:—How may Oleic Acid be readily and rapidly prepared in a condition sufficiently pure for preparing Oleate of Mercury? Referred to Charles Rice, of New York.

11. An Essay on the preparation of the various Bromides of the organic and inorganic bases used in American Pharmacy. Accepted by Charles Bullock, of Philadelphia.

12. What is the relative value of Extract of Quassia prepared with water, and prepared with diluted alcohol? Accepted by Joseph S. Whall, of Boston.

13. What is the minimum quantity of gum arabic that can be used to emulsify perfectly the fixed oils, volatile oils and balsams? Accepted by C. M. Hellman, of Cincinnati.

14. Can the formula for Scammony resin (U. S. P.) be improved, and what is the objection, if any, to the exhaustion of Scammony by alcohol at an ordinary temperature and simple evaporation of the tincture? Accepted by G. F. H. Markoe, of Boston.

15. What are the advantages of making Suppositories by moulding, over the method of making them by hand? Accepted by G. W. Kennedy, of Pottsville, Pa.

16. An Examination of Commercial Carbonates of Magnesium for Carbonated Alkalies. Accepted by P. W. Bedford, of New York.

17. An Essay on Pancreatine, and the various Pancreatic Preparations in use. Accepted by F. V. Heydenrich, of Brooklyn, N. Y.

18. Does water extract all the purgative principles of Rhubarb, and is the alcoholic percolate of rhubarb, after its exhaustion with water, inert? Accepted by C. A. Heinitsch, Lancaster, Pa.

19. An Essay on the active constituents of Bitter Orange Peel, with special reference to the bitter principle. Accepted by Prof. R. H. Stabler, Alexandria, Va.

20. An Examination of commercial Benzoin. What amount of impurity does it contain, and what are the relative proportions of benzoic and cinnamic acid? Accepted by W. H. Brill, Pittsburgh, Pa.

21. A comparative Examination of the Juice of the Root, and of the Flower Stems of Taraxacum Dens Leonis. Accepted by S. Mason McColin, Philadelphia.

22. There is a petroleum product called Cosmoline, having claims to considerable merit. Can its claims be established by experience, and to what uses pharmaceutically can it be put? Accepted by J. L. Lemberger, Lebanon, Pa.

23. How do the Ergots from the grasses, barley, wheat and oats, compare with the Ergots from rye in the medicinal effect? Accepted by J. A. Miller, Harrisburgh, Pa.

24. Can a Permanent Consistency and Specific Gravity be imparted to solid Extracts by the addition of Glycerine without injuring their quality? Accepted by O. Oldberg, Washington, D. C.

25. What preference is shown to Graduates in Pharmacy as compared with Non-graduates, and how do their salaries compare? Accepted by P. Balluff, New York.

26. How do the salaries of drug clerks compare with the salaries of clerks in other business, and with those of skilled mechanics? Accepted by H. N. Rittenhouse, Philadelphia.

27. Can statistics be obtained of the number of druggists in the United States, and can they be classified into a few general classes? Accepted by B. F. Stacy, Charlestown, Mass.

28. An Essay on Calabar Bean, giving the readiest method of ob-

taining the various pharmaceutical preparations, and isolating its active principle. Accepted by G. W. Kennedy, Pottsville, Pa.

29. What is the quality of the Iron by Hydrogen of the market? Accepted by J. Creuse, Brooklyn, N. Y.

30. What is the character of the principle to which the Bitterness of Eupatorium Perfoliatum is due? Accepted by A. Boyd, Utica, O.

31. What is the state of Purity of Commercial Santonine obtained from various sources? Accepted by Fred. Hoffmann, of New York.

32. Can the alkaloids of cinchona be extracted together in a crude form, yet sufficiently pure to permit a ready detection of adulterants; and if so, can the process be profitably carried out by the pharmacist? Accepted by Randal Rickey, of Trenton, N. J.

33. Medicinal Soap. Mr. G. H. Barkhausen gives a process in *Archiv für Pharm.*, Jan., 1873, pp. 20-21, for preparing this soap. Can it be substituted with advantage for Castile soap in the preparations of our Pharmacopœia into which soap enters as a constituent? Accepted by A. W. Marion, of Baltimore.

34. An Examination of Commercial Citrate of Iron and Quinia for its quinia strength. Accepted by Linus D. Drury, of Boston, Mass.

35. An Essay on granulated Effervescent Compounds. Accepted by R. V. Mattison, of Philadelphia.

36. How can Concentrated Preparations from aromatic drugs be best prepared, so that the preparation shall be permanent and represent all the active constituents of the drugs? Accepted by G. F. H. Markoe, of Boston.

37. The Relation of Physicians and Pharmaceutists. Is the pecuniary compensation of the Pharmaceutist adequate in comparison with that of the Physician? Accepted by E. P. Nichols, of Newark, N. J.

38. What is the most desirable Solution of Quinine for hypodermic injection? Accepted by A. P. Sharp, of Baltimore, Md.

39. Why do some of the diluted phosphoric acids of the market form precipitates with Tincture of Chloride of Iron, while others do not? Accepted by Louis Dohme, of Baltimore, Md.

40. When equal volumes of Tincture of Gelsemium and Nitric Acid are mixed, violent effervescence results with evolution of nitrous fumes, diminution of volume and some loss of color. What is the Cause, and what the Chemical result of the reaction? Referred to Charles C. Fredigke, of Chicago, Ill.

NEW MEMBERS OF THE A. P. ASSOCIATION.

The following named persons were elected members of the Association during its late sessions at Richmond:

G. J. Appleton, Keene, N. H.; C. W. Drake, Middleton, Mass.; Alvin E. Holt, Southbridge; C. H. Lawton, New Bedford; H. A. Lawton, New Bedford; T. E. Masters, Springfield; William McDonald, North Adams; D. W. Noyes, Lee; A. J. Preston, Springfield; John Redfearer, Fall River; J. S. Talbot, Boston; J. T. Webber, Springfield: J. O. Wild, Holyoke; Howard E. Wilson, Springfield; J. J. Whall, Boston; H. E. Gates, M. D., Litchfield, Ct.; H. Kelsey, Jr., New Haven, Ct.; Dwight Phelps, West Winsted, Ct.; F. A. Davidson, Providence, R. I.; Charles A. Althaus, Brooklyn, N. Y.; H. W. Atwood, New York; T. Call, New York; W. De F. Day,

M. D., New York; J. C. P. Fulton, Brooklyn; E. A. Frazer, New York; J. Hepburn, Flushing; E. Hartnett, New York; Th. Christinia, Washington D. C.; J. Anthony, Richmond, Va.; J. L. Avis, Harrisonburg, Va.; T. R. Baker, Richmond, Va.; Ira W. Blunt, Richmond, Va.; Henry Bodeker, Richmond, Va.; J. W. Burrow, Norfolk, Va.; W. A. S. Conrad, Richmond, Va.; P. E. Dupuy, Richmond, Va.; J. E. Dove, Richmond, Va.; S. W. Farrar, Richmond, Va.; H. E. Fischer, Richmond. Va.; P. R. Jones, Dansville, Va.; S. H. Lunt, Alexandria, Va.; R. Lecky, Richmond, Va.; R. H. Meade, Richmond, Va.; F. H. Masi, Norfolk, Va.; C. A. Nesbit, Richmond, Va.; W. H. Scott, Richmond, Va.; A. A. Scott, Richmond, Va.; J. W. Smith, Norfolk, Va.; W. A. S. Taylor, Norfolk, Va.; L. Wagner, Richmond, Va.; R. B. Wood, Richmond, Va.; A. S. Lee, Raleigh, N. C.; William Simpson, Raleigh, N. C.; L. J. Luhn, Charleston, S. C.; Charles S. Browne, Mobile, Ala.; P. Kuhles, New York; E. Mc Intyre, New York; J. Mingay, Saratoga Springs; O. Neustadt, New York; O. C. Weinmann, New York; David J. Bassler, Philadelphia, Pa.; William B. Burke, Philadelphia, Pa.; G. W. Carpenter, Philadelphia, Pa.; E. A. Cornell, Williamsport, Pa.; J. M. Cubbison, New Castle, Pa.; Charles T. George, Harrisburg, Pa.; Samuel Gerhard, Philadelphia, Pa.; Clay W. Holmes, Wilkesbarre, Pa.; H. G. Keasbey, Philadelphia, Pa.; R. V. Mattison, Philadelphia, Pa.; J. A. Miller, Harrisburg, Pa.; Henry C. Porter, Towanda, Pa.; William Smith, York, Pa.; John A. Weaver, Easton, Pa.; H. E. Wensel, Philadelphia, Pa.; W. N. Williams, Danville, Pa.; Charles Holzhauer, Newark, N. J.; William McCarty, Morristown, N. J.; J. W. Worthington, Morristown, N. J.; C. S. Adams, Baltimore, Md.; J. R. Beam, Baltimore, Md.; A. A. Kleinschmidt, Baltimore, Md.; D. F. Owens, Rockville, Md.; Henry Mittnach, Baltimore, Md.; W. A. Patten, Castleburg, Ky.; C. N. Rockefeller, Hot Springs, Ark.; William Jauncey, Chicago, Ill.; Charles W. Day, Urbanna, Ill.; John H. Flint, Marysville, Cal.—*Druggist Circular.*

COLLEGES OF PHARMACY.

NATIONAL COLLEGE OF PHARMACY.

The second annual session of this school of pharmacy will commence October, 1873, and terminate March, 1874. The Faculty are: Edward T. Fristor, Professor of Chemistry and Toxicology; Richard H. Stabler, Professor of Materia Medica and Botany; Oscar Oldberg, Professor of Pharmacy.

This college has departed from the usual routine of degrees adopted by the convention of teaching colleges of Pharmacy, in conferring the title of Doctor of Pharmacy on its graduates. This, in our opinion, is very unfortunate, as this degree had been selected to be bestowed upon such persons as have distinguished themselves in the advancement of the science of Pharmacy in this country. If we wish to advance the standard of the profession, we must have union of action in things so essential as a uniformity in titles.

SEMI-ANNUAL MEETING OF THE PHILADELPHIA COLLEGE OF PHARMACY.

The semi-annual meeting of the Philadelphia College of Pharmacy was held in the hall of the College, Monday afternoon, September 29, 1873. In the absence of the President, the Second Vice President, Robert Shoemaker, Esq., presided. The minutes of the last (annual) meeting were read by the Secretary, W. J. Jenks, after which the minutes of the Board of Trustees for the past six months were read by W. C. Bakes, Secretary of the Board. Professor Maisch, on behalf of the committee appointed to address a congratulatory letter to Prof. Carl Frederkirg, of Riga, Russia, on the attainment of his fiftieth anniversary in scientific pursuits, submitted a copy of a letter which the committee had forwarded to him.

Prof. Proctor, on behalf of the delegates to the American Pharmaceutical Association, lately held in Richmond, Va., read an interesting report.

W. J. Jenks presented, on behalf of G. D. Wetherill & Co., valuable specimens of cinchona barks, for the cabinet of the college.

Prof. Maisch presented, from F. B. Power, a beautiful specimen of mono-bromated camphor, crystallized. Also a fine set of materia medica plates, from L. Koch.

The Secretary read a letter from Mr. A. B. Durand, presenting to the college a valuable portrait of his honored father, the late Elias Durand, which was received with many expressions of thanks, and ordered to be placed in the college hall.

Prof. Proctor read a lengthy and interesting memoir of Mr. Elias Durand, which elicited remarks from a number of members, and, on motion, the memoir was ordered to be published.

An obituary notice was also read of Mr. John H. Ecky, formerly an active member of the college.

Mr. Charles Bullock announced the death of Frederick A. Keffer, M.D., at New Orleans, who died after a very brief illness.

A letter was read from Commissioner Douglas, of the Internal Revenue, containing an arbitrary ruling of the Internal Revenue laws, as applied to pharmacists. The matter has claimed the attention of pharmacists, and has awakened considerable interest. The Drug Exchange have also taken action, and appointed a committee to visit Washington.

On motion, a committee of two were appointed to go to Washington and have an interview with the Commissioner of Internal Revenue, and endeavor to have a more just construction of the law.

Mr. Bullock then read a series of resolutions looking to a repeal of the stamp act on medicines, and inviting the co-operation of other Colleges of Pharmacy and Pharmacal Associations.

The election of trustees was then held, which resulted in the election of W. H. Pile, C. Bullock, A. B. Taylor, S. M. McCollin, W. C. Bakes, W. McIntyre, Evan T. Ellis, and A. P. Brown.

At a meeting of the Philadelphia College of Pharmacy, held on the 29th September, 1873, the following preamble and resolutions were unanimously passed, and the Secretary was directed to forward a copy of the same to each of the Colleges of Pharmacy and Pharmaceutical Associations in the United States, and request their co-operation in effecting a repeal of the stamp tax:

Whereas, The stamp tax imposed by the Internal Revenue laws on medicines, as detailed in Schedule C of the Code, in the opinion of this College, intended to apply only to preparations known as "proprietary,"—the term "proprietary" having long been defined as a peculiar or exclusive right of possession;

And Whereas, Conflicting decisions have from time to time been given regarding the class of medicines coming under the operation of the stamp tax, causing great confusion, impeding business, and rendering druggists and manufacturers, disposed to a conscientious fulfillment of the provisions of the law, liable to great annoyance and often penalty, by reason of decisions of the Department at variance with the opinions and long-continued practice under former Commissioners of the Internal Revenue;

And Whereas, The necessity for the continuance of the stamp tax on medicines appears questionable as a source of pecuniary revenue to the Government;

Therefore, *Resolved*, That this college, in its corporate capacity, will petition Congress, at its next session, to abolish such part of the Internal Revenue laws as relates to a stamp tax on medicines.

Resolved, That we invite the co-operation of the Colleges of Pharmacy and Pharmaceutical Associations in the United States, to effect this purpose. ALFRED B. TAYLOR, *Cor. Sec.*

COLLEGE OF PHARMACY OF THE CITY OF NEW YORK.

Stated meeting of the Board of Trustees of the College of Pharmacy of the City of New York, held 4th September, 1873, Vice President Neergaard in the chair.

Treasurer's and Secretary's reports were read and, on motion, accepted.

Mr. Julius Kalisch was duly elected a member, and Mr. Otto Gellig was proposed as candidate for membership.

Eldridge W. Close, M.D., was elected member of the Board of Pharmacy, vice F. H. Weismann, M.D., resigned.

After transacting some other business of minor importance the Board then adjourned. H. A. CASSEBEER, JR., *Secretary.*

ST. LOUIS COLLEGE OF PHARMACY.

The annual announcement of this college has not reached us. From private sources we learn that the Faculty are, Theodore Fay, M.D., Professor of Chemistry; Otto A. Wall, M.D., Professor of Materia Medica, and Hubert Primm, M.D., Professor of Pharmacy.

TENNESSEE COLLEGE OF PHARMACY.

The opening of the first session of this young College of Pharmacy took place at Nashville, on Monday, October 6th, 1873, at the hall of the College, in the Bank of Tennessee building. The introductory lecture was delivered by Dr. J. B. Lindsley, giving a sketch of the origin of pharmacy and history of its separation from medicine; also mentioning the names of prominent chemists who were originally druggists, whose examples we have to follow in this first attempt at pharmacal education in the South, also referring to the steady advance of pharmacal science in this country, and the high position it has already obtained, proving that as students of the science of chemistry, botany, materia medica and pharmacy, its votaries rank as members of a scientific profession After the lecture the annual meeting of the trustees was held, and the following officers elected for the ensuing year: J. B. Lindsley, M.D., President; J. M. Safford, Ph. D., Vice President; W. L. Nichol, M. D., Secretary; Benj. Lillard, Phar. Ph. D., Treasurer; Thos. Black, M. D., Ass't Secretary and Librarian.

EDITORIAL.

BRITISH PHARMACEUTICAL CONFERENCE.

The tenth annual meeting was held at Bradford, England, September 16th and 17th, under the presidency of Mr. HENRY B. BRADY, F. L. S., F. C. S., of Newcastle-on-Tyne.

The following Pharmacal Societies and Associations were represented by delegates: Brighton, Bristol, Edinburg, Glasgow, Halifax, Hull, Leeds, Liverpool, Northampton, Nottingham, Manchester, and Sutherland. The number of delegates present at this meeting was larger than had attended any former conference, while the general attendance of members was not as numerous as on some former occasions. The meeting, however, was a great success in the contribution of scientific papers, the following being the list:

1. Unusually Large Doses in Prescriptions, should they be distinguished by signs, and by what signs?—Mr. H. Hampson, Mr. H. Whitfield; 2. Urinary Examinations in general, and the tests for Albumen and Sugar in particular—Mr. L. Siebold; 3. Amount of Calcic Oxalate Excreted in Oxaluria—Professor Attfield; 4. Composition of the Air Sewers and Drains—J. J. Nicholson, F. C. S.; 5. Commercial Sulphate of Copper—W. W. Stoddart, F. C. S.; 6. Ammoniacal Salts and their Usual Impurities —Alfred Payne, F. C. S.; 7. Pharmaceutical Notes; The Preliminary Examination; The Medical Profession; Pharmaceutical Titles—Mr. S. R. Atkins; 8. Absence of Morphia in the Petals of *Papaver rheas*—Professor Attfield; 9. Further Experiments on Nepaul Aconite, and on the Characteristics of the Aconitines—Thomas B. Groves, F.C. S.; 10. A new Test for Morphia—Mr. L. Siebold; 11. New Derivatives from Morphine and Codeine—Prof. C. R. A. Wright, D. Sc.; 12. On the Essential Oil of Orange—Professor C. R. A. Wright, D. Sc.; 13. On the Essential Oil of Nutmegs—Professor C. R. A. Wright, D. Sc.; 14. Report on the Purity of Commercial Specimens of Official Acids—Mr. L. Siebold; 15. The bearings of Alchemy on Pharmacy—Mr. W. D. Savage; 16. Note on the presence of Bromine, Iodine and Silver in Sea Water —Mr. G. A. Keyworth; 17. Detection of the Adulterations of Tea—Alfred H. Allen, F. C. S.

The following letter from a committe of the American Pharmaceutical Association was read:

To the British Pharmaceutical Conference, Henry B. Brady, Esq., President:

The undersigned, on behalf of the American Pharmaceutical Association, take great pleasure in presenting to the British Pharmaceutical Conference an album containing the shadows of some of the officers and members of our Association. May the fraternal feeling which has heretofore existed between these Associations ever continue, and the good work which has been accomplished for the advancement of the true interests of Pharmacy and its collateral sciences be an earnest of what the future may show. With great respect,

H. W. Lincoln, P. W. Bedford, J. T. Shinn,
Louis Strehl, M. W. Alexander,
Committee on Photographic Album, American Pharmaceutical Association,
By P. W. Bedford.

A message of fraternal greeting was sent to the meeting of the American Pharmaceutical Association at Richmond, Va. The President's (Mr. Brady) very able and interesting address embraced a variety of subjects of great importance to the Pharmacist. He referred to the many remedial agents introduced within the last ten years: Chloral, which has not yet realized our expectation; the application of Carbolic Acid in surgery, the extended employment of Phosphates which has given rise to many syrups prepared from various Phosphates, dissolved in excess of Phosphoric Acid, among them iron, calcium, sodium, potassium, nickel, and manganese, of the metallic bases, while of the alkaloids, quinia, and strychnina, altogether presenting a diversity of combinations; the efforts of the governments of Holland and Great Britain to introduce the various species of cinchona into their respective colonies, the importance of which we cannot overestimate.

The researches of Dr. Oscar Liebreich on Chloral Hydrate, Hydrate of Croton-Chloral and Propylamine; the introduction of gurana by Dr. Wilks, and the proposal of Mr. John Marshall to substitute Oleate of Mercury for Mercurial ointment; Mr. D. Hanbury's exhaustive paper on Pareira Brava; three new Pharmacopœas, Germanica, Helvetica and the Pharmacopœia of the United States, were noticed.

The standard of the examinations adopted by the Pharmaceutical Society was well defended. The death of Mr. J. C. Brough and our lamented Prof. Edward Parrish, were appropriately referred to.

Mr. Brady closed his address by reminding the members that there was but one object for the Conference—the advancement of Pharmacy, and by that means, the material and intellectual advancement of its members. Individual abilities, opportunities and inclinations may differ, but as a body there is a sphere of active usefulness for each, a line of duty easily ascertained, from which no man should shrink and hold himself blameless.

The annual dinner took place on Tuesday evening at 8 o'clock, to which seventy sat down.

On Friday, the conference, by invitation of the local committee, made an excursion to Bolton Abbey and woods. Previous to adjournment it was decided to hold the meeting for 1874 in the city of London. Mr. J. B. Groves, of Weymouth, the President elect, is well-known by his many scientific contributions to the profession, foremost among which are his researches on Aconite and its alkaloids. An interesting paper on the continuation of this subject was read at this meeting, and it gives us pleasure to record that the mantle of "Brady" has fallen on so worthy a successor. Taking it all in all, the tenth annual meeting of the British Pharmaceutical Conference, like that of the Twenty-first annual meeting of the American Pharmaceutical Association, was, in every respect, both pharmacal and social, a great success.

LETTER FROM THE COMMISSIONER OF INTERNAL REVENUE UPON THE INFRINGEMENT OF THE STAMP TAX BY DRUGGISTS.

The attention of our readers is called to the following letter of J. W. Douglass, Internal Revenue Commissioner:

Under this new and novel ruling of the commissioner it becomes necessary to affix revenue stamps upon all bottles containing laudanum, paregoric elixir, hive syrup, castor oil, solution of citrate of magnesia, as well as packages of soda and Seidlitz powders; also boxes of pills—in brief, all medicinal substances or preparations, whether officinal or not, are required to be stamped if the bottles or packages containing these medicinal agents are labeled with directions for use—e. g., if the label reads: Laudanum; *dose*, 10 *to* 20 *drops*—it requires a stamp. If the directions are omitted, so that it reads simply *Laudanum*, it is not liable to the stamp tax.

This may be the verbal reading of the law, but we are satisfied is not its spirit, and we had hoped that the commissioner would not at this late day have placed this construction upon it, when there has been some promise of repealing soon this system of collecting revenue from the people. Yet this obnoxious definition and ruling of the commissioner may result in some good. It will unite the trade in taking a decided stand against the enforcing of the law, and the result will be a speedy repeal of the stamp tax, as such interference with our legitimate business cannot be quietly submitted to, and such extreme measure always react upon its originators.

TREASURY DEPARTMENT,
OFFICE OF COMMISSIONER OF INTERNAL REVENUE,
WASHINGTON, September 9th, 1873.

Sir: I have received your letter of the 28th ult. enclosing samples of labels "used upon medicinal preparations and compositions largely manufactured and sold by all druggists and apothecaries," and which you state have hitherto been considered by you as not liable to stamp duty under Schedule C. These labels you have separated, characterizing them as "officinal" and "non-officinal," the first being "all published in the U. S. Dispensatory;" the second, "prepared or compounded according to the full and proper formula published in the different books or journals of pharmacy in general use among physicians and apothecaries."

You state in your letter that there seems to be considerable difficulty in determining which of these regular medicines are liable to stamp tax and which not,—and this matter is more or less perplexing to the trade, as well as to the revenue officers themselves, and that therefore you ask for a decision from this office with regard to the liability or non-liability of the medicinal preparations covered by these different labels, and which may apply, in general, to all medicinal preparations with similar labels attached.

In reply, I have to say that the opinion has been very generally entertained heretofore by manufacturers, compounders and vendors of medicines and medicinal articles, that only such medicines and medicinal preparations and compositions as were patent or proprietary, or made or prepared by some private formula, or occult secret or art, were liable to stamp tax; and that all medicines, &c., compounded according to the United States or other national Pharmacopœia, or where the full and proper formula is published in any standard medical authority, are exempt from such tax; and many revenue officers have, without a careful examination of the precise terms of the law, too generally aquiesced in the same opinion.

But the law, in fact, gives only a conditional exemption to any medicine or class of medicines. The class of medicines exempted and the conditions of such exemption are to be found in the 13th section of the Act of July 13th, 1866. Having carefully described what classes of medicines and under what conditions said medicines, &c., are exempt, it is declared peremptorily that "nothing in this section (viz., in section 13 of the Act of July 13th, 1866, and this is the only section in the law that authorizes any exemption) shall be construed to exempt from stamp tax any medicinal articles, whether simple or compounded by any rule, authority, or formula, published or unpublished, which are put up in a *style or manner similar* to that of patent or proprietary medicines in general, or advertised in newspapers or by public handbills, for popular sale and use, as having any special proprietary claim to merit or to any peculiar advantage in mode of preparation, quality, use, or effect, whether such claim be real or pretended."

It is held, therefore, by this office, that all medicines and medicinal preparations put up in a style or manner *similar* to that of patent or proprietary medicines in general are liable to stamp tax. The style or manner of putting up need not be exactly like the style adopted in putting up patent or proprietary articles. There need be only a similarity of style—a likeness in the general points.

What then, is the general style or manner adopted by the makers and venders of patent or proprietary medicines? This is a matter required to be known, in order to determine whether, in a particular or given case, the style or manner of putting up a medicine, not claimed to be patent or proprietary, is "similar;" and whether, on account of such style or manner, it ought to be stamped.

I reply that it is not alone or mainly in the shape or kind of bottle or enclosure containing the article, though liquid medicines are frequently put into peculiar shaped bottles, having the name of the proproprietor or patentee blown into the glass, but the leading characteristic of this style is (1) that such medicines are almost always put up in *retail packages*, packages which are sold *with their contents* directly to the consumer; and (2) each package is accompanied with a label, a handbill, or a wrapper containing an enumeration of the diseases or affections for which the medicine is a specific or remedy; containing also directions as to when and how it is to be taken, what constitutes a proper dose, either for an adult or a child, how frequently such doses are to be taken, &c., and generally such directions with regard to the mode of administering the medicine as physicians give when called to prescribe for a patient. These are the distinguishing characteristics in the mode or style adopted in putting up patent and proprietary medicines. It is a style adapted to popular sale and use—to enable the sick to supply themselves with the most popular remedies, and to use the same without the aid or assistance or even of the advice, oftentimes, of a physician or medical practitioner.

Medicines and medicinal preparations, whether "officinal" or "non-officinal," by whatever rule, or authority, or formula compounded, put up in such a style *in retail packages*, and accompanied with a label, a circular or a wrapper, giving the disease, diseases or affections for which such medicines have been and are to be used, and also specific directions as to the dose to be taken, or how the medicine is to be used are, in the opinion of this office, liable to stamp tax under Schedule C.

Again, the same class of medicine becomes liable to the stamp tax, if the maker or compounder, or the person offering them for sale, advertises them in newspapers or by public handbills as having any special proprietary claim to merit. Such proprietary claim may be implied by the use of the possessive case in describing the article, as, for instance, A's pills, or B's tincture, or C's powders, etc., implying special merit because such pills, tinctures, powders, etc., were made or compounded by A, B, or C, as the case may be. Or, again, such medicines become liable when the maker, compounder or vender, advertises them, as above, as having any peculiar advantage in mode of preparation, quality, use, or effect, whether such claim be real or pretended.

In fine, medicines and medicinal preparations, to be exempt from the stamp tax, *must not be patent or proprietary.* They must *not be put up in a style* or manner *similar* to that of patent or proprietary medicines. They must *not be advertised* as having any *special proprietary claim to merit, etc.* They must not be sold or offered for sale, or advertised under any *other name, form or guise* than that denominated and laid down in the *authorized* published medical works or journals.

Whoever departs from these plain and simple rules in making, preparing, recommending to the public, and vending, or offering, or exposing his medicines, etc., for sale, has no claim under the law to exemption from the stamp tax.

I return, as per your request, the sample labels you sent with your letter, and have only to remark that, in my opinion, medicines put up in retail packages with such labels affixed, *are put up in a style similar to patent or proprietary* medicines, and are not entitled to the exemption from stamp tax provided in the 13th section of the Act of July 13th, 1866. If there are any exceptions, I think you will be able, without difficulty, to determine them with the aid of this letter.

Yours, respectfully,
ALEX. P. TUTTON, Esq., *Supervisor*, Phila., Pa.
J. W. DOUGLASS, *Commissioner.*

—*American Journal of Pharmacy, Oct.* 1873.

The Committee appointed by the "Drug Exchange" of Philadelphia, to publish to the druggists of the country the recent arbitrary ruling regarding stamps on officinal medicines, and to solicit the influence of the entire trade in securing an early repeal of all of schedule C, relating to medicines, patent and proprietary, as well as officinal, desire to say that the expense of carrying out their instructions will be about ($800) eight hundred dollars for printing and mailing—say 15,000 pamphlets. This sum they desire to secure before incurring the debt, and they will not feel free to proceed, until assured that the money will be forthcoming. Each one interested is earnestly requested to give *early* information to some member of the committee as to what amount he is willing to subscribe. We believe that Congress can be induced to take early action in the matter; and it is the design to urge every druggist to advise his representatives as to the misconstruction of the law (for such we regard it), and to insist upon a clear definition, or a total repeal of the stamp tax.

The committee have given much time already, and it is hardly fair to expect them to call upon the members. The "Drug Exchange" is open daily from 1 until 2 o'clock, and some of the committee can always be found there at this time. Any surplus money will be refunded, *pro rata.* The matter is of great importance, and the money will be found—we think—to have been judiciously spent, in spreading broadcast the action of the "Exchange" in the manner proposed.

The committee consists of William Gulager, Alexander H. Jones, Charles Bullock, Henry N. Rittenhouse, Benjamin V. Mein.

BOOKS AND PAMPHLETS RECEIVED.

Chemical Electro-Therapeutics, Medical and Surgical; a handbook for Physicians in the Treatment of Nervous and other Diseases. By Allen McLean Hamilton, M.D. Illustrated. New York: D. Appleton & Co., 1873.

This little volume gives a very concise and well written statement of the latest facts concerning the remedial application of electricity, gleaned from the best sources, and including the author's experience in the hospitals of New York. The work will prove a simple guide to many who are not familiar with the modern uses of electricity, or the best form for its application. New discoveries and improvements in the electro-magnetic machines and batteries are noticed briefly, among which especial praise is bestowed upon the productions of the Galvano-Faradic Company of New York.

The First Book of Botany, designed to cultivate the Observing Powers of Children. By Eliza A. Youmans. New and enlarged edition, with 300 engravings. New York: D. Appleton & Co., 1873. 202 pp. Price $1.00.

Second Book of Botany; a Practical Guide to the Observation and Study of Plants. By Eliza A. Youmans. New York: D. Appleton & Co., 1873. 310 pp.

These manuals on botany we heartily recommend to beginners as practical text-books. Messrs. D. Appleton & Co. are represented in Chicago by P. B. Hulse, 117 & 119 State Street.

Pharmaceutical Lexicon: a Dictionary of Pharmaceutical Science, containing a concise explanation of the various Subjects and Terms of Pharmacy, with appropriate Selections from the Collateral Sciences, &c., &c., designed as a guide for the Pharmaceutist, Druggist, Physician, &c. By H. V. SWERINGEN. Philadelphia: Lindsay & Blakiston, 1873.

Such a work as the title of this book calls for would be of the greatest use to the pharmacist or physician, and it is with pain that we say of this what we feel compelled to: that it is not a safe "guide" to the learner, nor a "lexicon" for the learned.

It would require more space and time than is at our command to adequately review this book. Probably each one who consults its pages will place his own estimate of its value to him, and it is only for the reason that the inexperienced pupil may be misled in his search for truth, by depending on this or other faulty mediums, that we express our opinion of its character. A scientific dictionary should be as accurate as the existing knowledge of the sciences will permit, and anything short of this renders the book useless to the student, and, in matters pertaining to pharmacy, possibly dangerous. Words have a recognized meaning, and it is this only which makes them of any value. To abridge or change the value or meaning of words may mislead as effectually as to misstate a proposition. In the above-mentioned particular we think the author has erred to the injury of his book. He to some extent forewarns us by saying in his preface that "he regards the derivation of words as a matter of secondary and comparatively very little importance." If he had not reduced his "regard" to practice we should have had less to find fault with. The most serious fault, however, lies in the erroneous "scientific" statements pertaining to preparations, to illustrate: "Acid Sulphurous—a sulphuric acid containing only two-thirds as much oxygen as the officinal sulphuric acid. It is, when officinal, nearly a saturated solution of sulphurous acid gas." Query—How many kinds of sulphuric acid have we? When did sulphurous become A sulphuric acid? What is *it* when *not* officinal? A saturated solution in *what?* The next is like unto it. "Acid Tannic—an acid obtained from nutgall. It is a valuable astringent." Are we to be limited to nutgall for the production of tannic acid? Is the student to learn only to unlearn? Our author's geography is also faulty. See "Eau de Cologne—a perfumed spirit, originally prepared at Cologne, a town in *France*." We have marked dozens of like definitions, taken at random from different pages of the book, nearly all traceable to carelessness in compiling, as in these days there is no lack of accurate sources of information, and care in selecting authorities would avoid such errors altogether. Webster's Dictionary seems to have been largely drawn upon, and we hardly need to inform our friend that for definitions of a technical nature he could find a better guide. The publishers have done their work well, as Messrs. L. & B. are in the habit of doing. We hope the work will be carefully revised, also abridged, by omitting many duplications of words, and some useless matter. The design of the work is good, and if carefully edited, the book would prove a very useful one. On this basis we shall heartily welcome a second edition.

The Medical Brief, September, 1873. A Monthly Journal of Medicine, Chemistry, Pharmacy and Hygiene. Edited and published by J. J. Lawrence, M.D., Wilson, North Carolina, at $1.00 a year.

We welcome this sprightly, new publication to our exchange list, and wish for it many readers and much success in the sphere of usefulness which it has selected. The present number is well filled with short, practical articles on the science, all interesting and well selected, and the journal is well deserving of the motto, "Multum in parvo." Among the contents we find the following:

"ADULTERATION AND SHORT WEIGHT. BY ROWLAND, (DRUGGIST), WILSON, NORTH CAROLINA.

"The attention of druggists and physicians is called to the large percentage of the capsule of Papaver somniferum in much of the Gum Opium in the market. Of two samples treated, one contained 27.5 per cent. and the other 29.5 per cent. of the adulteration. The question very naturally presents itself as to whether or not the Pharmacopœia in the various preparations of Opium anticipates so much adulteration. We think not, inasmuch as the best authority gives the maximum only 8.33 per cent.

The short weight of the sulphates of Quinia and Morphia has been a matter of frequent observation. The ounce of Quinia put up by P. & W. rarely exceeds in actual weight seven drachms, while the drachm of Morphia, P. & W., has an actual weight of only 54 grains. How the loss of 12.5 per cent. of the former and ten per cent. of the latter is accounted for, we leave with the manufacturer. Certain it is, the loss of so large a percentage of these alkaloids, from well corked and securely sealed bottles, cannot be estimated, by any chemical theory known to us."

Regarding the subject of short weight of Sulphate of Quinia and Morphia, it is surprising that any druggist should not be familiar with the fact that all goods in our line of trade are bought and sold by Avoirdupois weight, and therefore that an ounce of Sulphate of Quinia weighs 437.5 grains, and not 480 grains, which is the weight of a Troy ounce. Also, that manufacturers do not put up in bottles Drachms, but fractions of the Avoirdupois ounce, as ¼, ⅛. Therefore 54 grains is nearly the correct weight of a bottle of Sulphate of Morphia marked ⅛.

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FERRIC CARBONATE.

BY R. ROTHER.

Chemists at the present day conclusively accept the non-existence of ferric carbonate. But the writer has succeeded by means of a peculiar manipulation in producing a ferric compound which contains the veritable body, although not in an absolutely definite condition.

The process under consideration admits the generation of this exceedingly useful compound in any desirable quantity with comparatively equal convenience and dispatch.

The method of preparing the iron combination containing the ferric carbonate is so remarkably simple and expeditious that the writer believes henceforth the troublesome ferric hydrate will be, at least for most all pharmacal purposes, forever superseded by the admirably adapted ferric oxycarbonate.

This new combination differs chemically, physically and technically from the ordinary ferric hydrate in the following particulars: It is firstly although but partially a real carbonate, and therefore probably not susceptible of conversion into medicinally unavailable and pharmacally inapplicable inert allotropic modifications.

The adverse property which imparts the peculiar tendency to abandon water of hydration and assume inactive forms, and therefore so seriously detracts from the efficiency and general utility of the gelatinous ferric hydrate precipitated by ammonia, does not seem to be possessed by this carbonated ferric base.

Ferric oxycarbonate (an expression which the writer merely employs as a distinguishing term) when yet moist, differs characteristically from the hydrate by the copious effervescence of carbon dioxide when treated with acids. Furthermore its solution in acids is immediate and perfect, definite and exact saturation being a predominant feature.

Normal salts are thereby only permissible as basic compounds are wholly precluded, since an excess seems to remain undissolved, and therefore the point of saturation is attained without loss of time.

Another point of distinction is found in the remarkable fact that certain organic acids, as citric for example, do not act energetically on it in the cold, shown by the feeble effervescence, but that the application of a moderate heat determines a combination almost instantaneously attended with a profuse evolution of carbon dioxide, and the production of a perfect solution at once.

Secondly, ferric oxycarbonate differs diametrically from the hydrate in form. It is not gelatinous, but compact, yet not granular, and not exceedingly heavy. It possesses a remarkable evenness of structure and aggregation, being miscible with water to the production of a uniform fluid, holding the precipitate regularly suspended during the course of its deposition when placed at rest.

It differs from the hydrate decidedly in color, whilst the hydrate is brownish-red this is bright-red, when moist, approaching to scarlet when dry.

In its practical bearing ferric oxycarbonate, owing to its compact form, readily subsides and deposits rather firmly, rapidly and closely. This presents the incalculable advantage possessed by such precipitates in being readily washed by decantation; the most perfect method of washing precipitates at present known. After perfect washing by this method, the precipitate separated from water as nearly as practicable by decantation, is poured upon a filter and allowed to drain. This removes all the water except that confined within the interstices of the particles, a quantity which is surprisingly small. The washing is completed in 4 to 6 hours, during which time the water can be renewed 4 or 5 times; after the last decantation the washings drained from the filter do not react with barium chloride.

The precipitate, when removed from the filter and dissolved with the aid of gentle heat in citric acid, for example, forms a solution stronger than the officinal solution of ferric citrate, and therefore requires dilution instead of considerable evaporation as is usually required by the ordinary method.

The writer having found a decided advantage to accrue from the application of concentrated solutions which were mixed by pouring the iron solution as neutral as possible into an excess of concentrated ammonia, concluded that perhaps the ammonia could well be replaced by sodium carbonate.

Thereupon the writer employed crystallized disodic carbonate in small fragments and in slight excess, and treated this directly and by the aid of heat with the undiluted solution of ferric sulphate. The resulting precipitate was the ferric oxycarbonate.

The writer's process for preparing ferric oxycarbonate is as follows:

Take of	Ferrous sulphate cryst. - - -	24 troy ounces.
	Sulphuric acid - - - - - -	4¼ "
	Potassium chlorate - - - -	848 grains.
	Disodic carbonate. cryst. - -	44 troy ounces.
	Water sufficient.	

Pour the sulphuric acid into 2 pints of water with constant stirring and add the ferrous sulphate; with continued stirring now add the potassium chlorate a little at a time at first, but more rapidly in proportion as the ferrous sulphate dissolves. Then place the sodic carbonate into a capacious vessel and add about one-fourth of the solution of ferric sulphate, or better, use first a similar volume of water, apply heat immediately, and when nearly all the carbonate is dissolved add the remainder of the solution, one-fourth at a time, with constant stirring. Dilute the mixture with 6 to 8 times its volume of water, let the precipitate subside, and remove the supernatant liquid by means of a syphon, mix the residue again with water as before, and repeat the washing as at first, 3 or 4 times, or until the washings give no precipitate with barium chloride. If large vessels for this purpose are not convenient the precipitate may be divided among a number of smaller vessels and thus washed with equal rapidity and perhaps greater facility in the manipulation. Lastly, pour the precipitate after the final decantation, upon a filter, drain off the surplus water, and spread the residue out to dry in the open air.

The writer now prepares solution of ferric citrate as follows:

Take the washed and drained precipitate of ferric carbonate obtained from 24 troy ounces of ferrous sulphate as above.
Citric acid cryst., 18 troy ounces.
Water if required sufficient.

Place the citric acid into a capacious capsule, add the precipitate gradually and heat the mixture, after solution is complete add water if necessary to the measure of 3 pints and strain through muslin.

The moist ferric oxycarbonate is most conveniently dried by the method used for the production of drop chalk and other material exhibited in that peculiar form. It dries without shrinking unevenly, and therefore presents no fissures in the dried mass. When dried between folds of paper it does not adhere, but drops off readily in friable fragments which crumble under mild pressure to an almost impalpable powder. It is therefore most easily powdered by rubbing in a mortar. The powder retains the original bright color. The fine appearance readily distinguishes it from the dried hydrate, as the latter is nearly black in the unbroken fragments, which are exceedingly hard, gritty and difficult of pulverization.

The writer believes that this oxycarbonate is a great improvement over the officinal subcarbonate of iron in many respects.

For the preparation of ferric acetate solutions, it is particularly adapted, firstly, since it can be so perfectly washed; secondly, so rapidly and thoroughly freed from most of the adhering moisture, which is an especial point of importance, because the solutions should be from the first at their utmost concentration, as heat is not admissible in connection with an absolutely pure ferric acetate; thirdly, that definite and exact saturation can be speedily attained; and fourthly, that absolutely pure ferric acetate can thus be produced from a ferric compound which presents the iron in its normal and active state, and consequently the resulting salt will not be so prone to generation of insoluble basic acetates.

The approximate composition of ferric oxycarbonate was determined as follows:

The precipitate was thoroughly dried between folds of bibulous paper, then powdered, and finally exposed for several days in the dry open air.

100 grains of the powder was now weighed off and allowed to remain on the balance, after 24 hours it was observed that the weight was regularly and constantly diminishing. The original weight was then restored by a further addition of the powder, but after 6 or 8 hours another addition was required to restore the equilibrium.

In the course of 3 days, the powder having constantly decreased in weight, it was found that between 2 and 3 grains of the powder had been successively added to counterbalance the original weight.

At this juncture 50 grains of the powder was treated with chlorhydric acid in an apparatus for the estimation of carbonic acid; when it was found that only 3.4 grains of carbon dioxide was present in the combination ; 100 grains, therefore, contained 6.8 grains carbon dioxide.

25 grains of the powder was then heated to redness for a short time in a platinum crucible, weighed, again heated to redness for a short time and re-weighed. The first and second weighings were identical in result. A dark brown residue of 16.25 grains remained, leaving 8.75 grains for carbon dioxide and water. However, on cooling, the weight of the residue increased .2 of a grain, which must therefore be deducted as hygroscopic moisture in the original substance, yet this inferrence is only approximative, as the altered body may possess a different disposition in this regard when compared with the first substance and its relative quantity. The brown residue remaining after ignition of the oxycarbonate is utterly insoluble in chlorhydric acid, and the non-appearance of effervescence now conclusively shows that the precipitate was free from any adhering sodium carbonate.

100 grains of the powder therefore contains 65 grains ferric oxide, and 35 grains carbon dioxide, water of hydration and hygroscopic moisture. Deducting the 6.8 grains carbon dioxide and 28.2 grains remain for water of hydration and hygroscopic moisture, substracting .8 grains as atmospheric humidity absorbed by the powder, and 27.4 grains is left as water in actual combination. Hence 99.2 grains of the absolutely dry iron compound contains 65 grains ferric oxide, 6.8 grains carbon dioxide and 27.4 grains water of hydration.

Now dividing the number indicating the weight of the ferric oxide 65, by its equivalent number 160, and .40625 results as a quotient.

Dividing 6.8 the number denoting the weight of the carbon dioxide by its equivalent 44, and .15454 is obtained as a quotient. Likewise dividing 27.4, the weight of the water, by 18 its equivalent, and 1.52222 results.

Now dividing each of these numbers by the first quotient and we have in succession 1, .38 and 3.75, or approximately 1, .4 and 4.

But in consideration of the constant dissipation of carbon dioxide during the drying of the powder, we can safely write 1, .5 and 4, which may then be formulated thus :

$$Fe'''_2\,3(CO_3).\quad 4(Fe'''_2\,6(OH)).\quad Fe'''_2O_3.$$

This formula assumes the presence of normal ferric carbonate and normal ferric hydrate in combination with anhydrous oxide.

The proportion of carbon dioxide actually present is, however, only one-sixth of what would be needed to form normal ferric carbonate with all the iron contained in the compound.

It is, however, highly probable that perhaps twice the indicated amount of carbon dioxide exists in the freshly precipitated carbonate, since during the process of washing bubbles of gas continually rise, and moreover the copious effervescence of the moist fresh precipitate when heated with citric acid, for instance, goes far to aid that supposition.

The moist precipitate could also be determined with great accuracy, comparatively, by operating upon a definite weight of pure ferrous sulphate and estimating the carbon dioxide in the moist magma immediately after thorough washing. The result would, however, be only interesting in so far as to how much more firmly the moist body retains the acid than the dry.

By changing the order of mixing the solutions, and otherwise altering the method of manipulation, distinctly characteristic products are obtained. If, for instance, the whole of the ferric solution is poured upon the carbonate in the cold, a deep red solution will result at first, even after much effervescence has occured and a large quantity of the carbonate has dissolved; if now heat is applied to the mixture, precipitation takes place, and although the resulting compound contains ferric carbonate, it nevertheless is more bulky, much darker colored, and generally inferior to the bright colored oxycarbonate.

If the solution of ferric sulphate is first heated and then treated with sodium carbonate by gradual addition, a deep ruby red liquid results, which on the further increase of heat sets to a stiff transparent ruby red jelly, which when further treated with alkaline carbonate forms a bulky gelatinous precipitate, probably containing alkali. Much carbonate can be thus added to the iron liquid, and if the heat is timely removed the solution will remain intact, and perhaps a tolerably pure and concentrated solution of an highly basic oxysulphate could be prepared from it by dialysis.

METHENYL IODIDE.

BY R. ROTHER.

Iodoform is best prepared by the process of Wittstein, which consists in gently heating a mixture composed of dipotassic carbonate, 2 parts; iodine, 2 parts; alcohol, 95 per cent. one part; and water 5 parts, until the liquid becomes colorless. The bright yellow scaly precipitate is rinsed upon a filter, washed, and dried in the open air.

The yield is 17 per cent. or one-sixth of the iodine used.

It will be seen that this is not an economical process when reference is only had to the iodoform product, but Wittstein providently directs the purification and saving of nearly all the iodine which has passed into other combinations through the resulting reactions.

By evaporating the filtrate to dryness, mixing the residue with charcoal, calcining at a red heat, dissolving in alcohol, filtering, and again evaporating, nearly all the wayward iodine is secured as pure potassic iodide.

There are other methods somewhat different in principle, which give a greater yield of iodoform from the iodine employed, but Wittstein's process, for simplicity and general economy, excels them all.

Wittstein, in remarking upon the diverse reactions which the process determines, shows, firstly, that a large amount of iodine is lost to the iodoform yield by reacting directly with the carbonate, and thus producing potassium iodide and potassic iodate, as shown in the following reaction:

$$3(K_2CO_3)+6I=5KI+KIO_3+3CO_2.$$

Secondly, that a portion of the iodine reacts directly with the alcohol generating ethyl iodide which escapes as vapor and hydric iodide, which, reacting upon the carbonate, forms potassic iodide and carbon dioxide evolved with effervescence. Ethyl iodide is quite appreciably given off and entails a direct loss of iodine, which can not be recovered in an available form, unless some use can be made of it in this condition, however, ordinarily it would scarcely repay the effort of collecting.

Thirdly, appears the direct coalition between alcohol, potassic carbonate, and iodine, emerging again as methenyl iodide, potassic iodide, potassium formate, water and carbon dioxide, which he explaines thus:

$$C_2H_6O+8I+3(K_2CO_3)=CHI_3+5KI+KCHO_2+2OH_2+3CO_2.$$

Now since the product for which the process is worked is so small therefore, a large amount of expensive material has to be manipulated, and although both products are useful and staple, nevertheless the large manufacturers always charge a price for iodoform which approaches the total cost of the iodine consumed, hence the large producer pockets a gain he is not justly entitled to, and as the dispenser must adjust his price according to the manufacturer's demand, consequently the consumer is burdened ultimately with an exaggerated cost for a fictitious value, which, under the circumstances, seems like extortion in the last degree.

With a view to alleviate this irregularity and render the process less expensive and more productive, the writer resorted to a trial with various bases, believing that a less energetic metallic base would not seize the iodine so voraciously as to leave but a small remnant available for the objective compound. For this purpose calcium carbonate, borax, and disodic carbonate were tried. However, none seemed to answer at all, disodic carbonate showed more disposition then the first 2. However, the iodine during the digestion was held so loosely that a considerable portion sublimed into the neck of the bottle.

Upon this the writer's first impulse was to employ bromine to replace the iodine, in the stronger combinations with the potassic base, but in view of the fact that a great probability existed for the generation of an undesirable bromiodoform, the writer also abandoned this project.

Attention was next directed to the uselessly combined iodine, for a continuation of the process, and for this purpose the writer proposed to liberate this iodine and cause it to react a second and third time, or until consumed as iodoform if possible. Now, it is known that when a mixture of an iodide and iodate is treated with an acid so as to produce hydric iodide and hydric iodate, these new bodies will react upon each other, resulting in their total disruption into free iodine and water, thus:

$$5HI+HIO_3=6I+3OH_2.$$

Or, in case of potassic salts treated with chorhydric acid, thus:

$$5KI+KIO_3+6HCl=6I+6KCl+3OH_2.$$

Therefore, if after the separation of the generated iodoform, the colorless liquid is acidulated with chlorhydric acid, all the iodine combined in the first instance will again be freed, however, this treatment still leaves that which was absorbed in the second and third stages in an occluded state. To render this also available, the writer employed chlorine indirectly, or rather in a nascent state, by causing acid potassium chromate to act upon the potassic iodide in the presence of chlorhydric acid, which results in the liberation of the iodine and the formation of chromic chloride, thus:

$$6KI+K_2CrO_4.CrO_3+14HCl=6I+8KCl+Cr_2Cl_6+7OH_2$$

Or

$$K_2CrO_4.CrO_3+14HCl=Cr_2Cl_6+2KCl+6Cl+7OH_2$$

And

$$6KI+6Cl=6KCl+6I.$$

Therefore, the writer has modified the process in accordance with these results, and succeeded in converting the iodine wholly (excepting that carried off as as ethyl iodide) into iodoform, by repeatedly freeing and allowing it to decompose additional alcohol.

The writer conducts the process as follows, and in order to secure a uniform product for each repetition, about one-sixth of the original amount of iodine is regularly added after each operation.

Four troy ounces of iodine; 4 troy ounces of dipotassic carbonate; 2 troy ounces of 95 per cent. alcohol, and 10 troy ounces of water are mixed in a comparatively large flask and warmed in a water bath until the solution is decolorized; the clear liquid is now decanted and the precipitate rinsed, with the addition of a little water, upon a capacious filter. The decanted liquid is now treated with chlorhydric acid, adding this gradually at first, and an excess of 2 or 3 ounces is then added, together with ¼ to ⅜ ounces of acid potassium chromate, in powder; after a few moments, dipotassic carbonate is carefully added to neutralization, and then 4 troy ounces more is introduced, together with about ¾ of an ounce of iodine and 2 ounces of alcohol, this mixture is again digested in a water bath, and when effevercence has ceased in the green solution, the supernatant liquid is poured off from the precipitate, and further treated as before. The precipitate is rinsed into the filter with the first product, and when the process is discontinued, the gathered crystals are well washed with water, and spread out in the open air to dry.

Thus the process may be continued indefinitely or until the saline accumulation becomes too great. When after several repetitions, the liquid gets too bulky, it may be condensed by evaporation.

The potassic carbonate does not seem to precipitate chromic hydrate from the solution, the formic acid renders this soluble in the alkaline liquid.

Wittstein has found that an excess of the carbonate is not injurious, but seems rather to be an advantage.

The writer finds also that an excess of chromate exerts no opposite tendency, and to judge from limited observations, it would seem that with this in the alkaline liquid in presence of sufficient alcohol, the iodine is not so largely absorbed by the alkaline base, as the yield of iodoform under these conditions is greater.

The only additional expense in this process is the chromate and chlorhydric acid, but the required quantity of the former is small, and the substance itself is cheap.

The ordinary commercial chlorhydric acid can be used, and therefore the additional outlay in this case is also trivial.

The most satisfactory results, however, are obtained by the use of wood spirit. In this case the iodoform yield at each operation exceeds one-third of the weight of iodine used. The reaction evidently differs from that with ethyl alcohol. An exceedingly irritating gas (to the eyes) is simultaneously evolved.

It will be apparent that this method, put into general use, ought to bring the price of iodoform within reasonable limits.

POTASSIUM PHENYLSULPHATE

BY R. ROTHER.

After an extended acquaintance with the salts of phenylsulphuric acid, the writer published some of his observations in the September number of THE PHARMACIST, being at the time unaware of the fact that Kekulé had already discovered the isomerism of the acids (designated as para and meta phenylsulphuric acid) as early as 1867.

Simultaneously the writer gave the method of purification of the general results and separation of the various products. It was then the belief of the writer that the more soluble and difficulty producible salts with peculiar bases could be purified by a modification of the method described.

Potassium phenylsulphate being a popular salt, was produced by the writer in equal purity to the sodium salt, but not precisely by a similar process, or even a method which would be designated as a modification involving the fundamental principles of the former.

The very satisfactory and efficient operation for preparing the potassium salt, or rather salts, is conducted as follows: 8 troy ounces of the crude phenylsulphuric acid, prepared as previously directed, is diluted with 8 fluid ounces of water, and nearly neutralized with dipotassic carbonate, (salt of tartar). About 3 troy ounces of this is necessary.

The solution is set aside for several hours to allow the silicic hydrate, (an impurity of the commercial carbonate) to precipitate.

It is then warmed and filtered; after cooling the liquid poured off the crystalline deposit, (about ½ a troy ounce of the first or A potassium salt will have crystallized out) is evaporated to about 10 fluid ounces and again permitted to cool. Nearly 2 troy ounces more of the A salt will have crystallized out. The first and second yield is now separately washed with a little cold water and the washings mixed with the solution of the remaining salt poured off from the second crystallization. This mixture is then evaporated to about 6 fluid ounces, and while yet warm, 6 to 8 fluid ounces of strong alcohol is poured in. This mixture is now set aside in a warm place and allowed to settle; the whole is then transferred to a filter, and when the solution has ceased to pass through, the residue of potassium sulphate is washed with 3 or 4 fluid ounces of diluted alcohol. The whole filtrate is now evaporated to dryness to expel the alcohol, the residue redissolved in 6 fluid ounces of water, a ¼ troy ounce of purified animal charcoal added, the mixture heated to boiling, filtered and set in a moderately warm place to cool down slowly. The liquid is then poured from the crystalline residue, and again evaporated together with the washings obtained from rinsing the crystals with a little cold water. The final crop of crystals thus obtained may not be entirely free from adhering phenol, because charcoal, although removing the color completely, does not so perfectly separate the phenol. The last crystals, together with the remnantal solution, will again become colored by exposure during the course of evaporation, as the phenol suffers continual change, resulting in the formation of colored products, which have a particular affinity for the B salt, whilst the A salt, if contained in a solution together with the coloring matter, will yet remain uncontaminated and colorless after crystallization.

By this process the first 3 crystallizations will contain the A salt wholly. The first 3 products are free from the B salt, but the fourth result is a mixture of the two. Both salts are rather more soluble than the sodium salts, and in their form less definite and distinctive. As ½ a troy ounce of A salt is obtained from the dilute solution in the presence of an ample excess of water, and as after washing, the crystals do not react with barium chloride, we must infer that the solution saturated with potassium sulphate acts approachingly similar to a saturated solution of sodium chloride, only with this difference, that whilst the chloride separates the sodium phenylsulphate completely, the potassium sulphate only causes a small proportion of the corresponding phenylsulphate to crystallize out.

The A potassium phenylsulphate crystallizes in white crusts composed of small, ill-defined, oblique, rhombo-prismatic crystals. It is remarkable for the peculiar metallic sound, (not sonorous, but very like the sound of granulated tin) the crystals emanate when agitated

The B salt is crystallized in slender prismatic needles, aggregated in radial tufts, the stellate groups are not, however, so well defined and so evenly formed, as in the corresponding sodium salt, yet their peculiar lightness is similarly characteristic with this compound.

In order to find the relative composition of the 2 potassium salts in relation to water, the writer pulverized the salt procured in the first 2 crystallizations without the use of alcohol, dried it in the open air, and subjected 100 grains of it to 212° F. for about 3 hours; no very appreciable loss having occurred, the temperature was raised to 240° by means of a chloride of calcium bath, and maintained for an hour, but without further diminishing the weight, which had decreased only .17 of a grain, After cooling the original weight was again restored from absorption of moisture. 100 grains of the salt obtained in the third crystallization, after the sulphate had been removed with alcohol, was then similarly treated, yielding an identical result. The writer therefore concludes that the A potassium phenylsulphate is anhydrous and may be written thus:

$$K(SO_4)(C_6H_5).$$

The radial groups in the fourth crystallization were then carefully collected, pulverized and air dried. 100 grains of the powder was heated to 212° F. until it ceased to lose weight; the temperature was then raised to 240°, and kept up for some time, but without further effect upon the weight. However, the salt began to show a tendency to fusion at this heat. Upon weighing the substance hot a loss of 8.417 grains was indicated, but after cooling the weight increased .6 of a grain, showing therefore that the original 100 grains had contained only 7.817 grains of water of hydration, since the extra .6 grains must be counted only as hygroscopic moisture, hence the 100 grains actually contained but 99.4 grains of salt, and upon which the 7.817 grains of water must now be calculated to ascertain the water's equivalent in the salt.

Substracting 7.817 grains from 99.4 grains, the remainder is 91.583 grains, which represents the anhydrous salt corresponding to the group $K(SO_4)(C_6H_5)$, with an equivalent weight equal to 212.11. Dividing 91.583 by this number, the quotient .432 is found, and dividing 7.817, representing the water of hydration, by 18, the equivalent of H_2O and .433 results as a quotient. These two results are practically equal, therefore, the salt is constituted thus:

$$K(SO_4)(C_6H_5)H_2O.$$

Hence the molecular formula for the A salt is $K(SO_4)(C_6H_5)$, and the molecular weight 212.11.

The molecular formula for the B salt is then $K(SO_4)(C_6H_5)H_2O$, with the molecular weight 230.11.

That is the first salt is anhydrous, and the second salt contains one equivalent water of hydration.

In conclusion, the writer will state that it is probable a third salt is also present, although in small proportion, as it was observed when a solution of the B sodium salt was permitted to crystallize spontaneously from a cold saturated solution, that besides the beautiful radial feathery tufts, a more compact and differently crystallized salt was also deposited in cauliflower or warty clusters, and which in regard to affinity for the peculiar coloring matter, stands between the A and B salts, as portions of it crystallized perfectly colorless, whilst others in the same solution were decidedly tinged. A difference in the taste of the salts is also apparent. The B salt is nauseatingly bitter, and the intermediate salt again stands in the middle of the two in this particular.

FERRIC PHOSPHATE.

BY R. ROTHER.

Ferric phosphate is usually considered to be a very definite chemical, susceptible of exact determination and capable of entering into definite and soluble combinations with acids and various salts, particularly those of organic acids with a monad base. However, the resulting body as obtained by different methods of manipulation is not always identical nor even chemically similar in the predominant points. Usually when a normal ferric sulphate in concentrated solution is poured into an excess of disodic orthophosphate, also in hot saturated solution, or if a basic ferric sulphate be similarly treated, the precipitated normal ferric orthophosphate will always be more or less contaminated with basic salts.

The solution of ferric orthophosphate in ammonium citrate is nevertheless a more stable and convenient preparation than the officinal ferric pyrophosphate. The latter salt is less soluble and therefore more easily and elegantly scaled, but since these compounds are properly administered only in a liquid form, it is therefore an advantage to employ a salt of greater solubility, which especially is permanent in solution. The pyrophosphate when dry and exposed to light is rapidly discolored and decomposed, and when in solution it is speedily converted into orthophosphate. The pyrophosphate is prepared by an exceedingly circumstantial process which ordinarily is impracticable, consequently the dispensing pharmacist will have to procure his supply from the wholesale manufacturer. But the ferric orthophosphate when dissolved in ammonium citrate, even if in the utmost concentrated state, will rapidly decompose, particularly in warm weather, however, in this respect the citro-ammoniacal pyrophosphate is precisely similarly disposed. The disruption is usually indicated by the formation of mould which invariably accompanies the destruction of the salt. Many soluble citrates are perfectly proof against spontaneous decay, yet when ammonia is present in the combination, the dissociation is not so easily counteracted, but if the compound in addition contains phosphoric acid, the climax of instability is insured. Ammonia is a fertile base for mouldy formations, but phosphoric acid will generate organic growths if only a trace of available material is present.

The citro-ammoniacal ferric orthophosphate, in concentrated solution can be well protected by means of sugar, if this is added in sufficient quantity to form a dense syrup, the green color of the solution is perfectly retained, but recently the writer has observed that a sample several years old, which during the hot weather had been stored away in a partially filled bottle in a dark place, had generated mould on the surface and become dark brown in color. It was also noticed that a specimen 3 years old preserved with glycerin was yet perfect.

With the aid of sugar a solution can be prepared which is just half as strong in iron as the officinal solution of ferric citrate. However, when glycerin is employed the strength of the solution can be doubled; that is, be made identical in iron strength with the solution of ferric citrate.

The writer has now adopted this latter strength, adding glycerin in the proportion of 4 fluid ounces in the pint of finished product.

When ferric sulphate in moderately dilute solution is treated with disodic phosphate, also in dilute solution, but only in equivalent proportion, then the liquid filtered off the precipitate will be acid, and it can be assumed that the acidity is derived from the presence of acid sodium sulphate (SO_4NaH).

But usually it is accepted that free sulphuric acid results, thus:

$$(SO_4)_3Fe_2''' + 2(PO_4Na_2H.12OH_2) = 2(PO_4Fe'''4OH_2) +$$
$$2(SO_4Na_2) + SO_4H_2 + 16OH_2.$$

In medium concentration the free sulphuric acid will retain much of the ferric phosphate in solution, but if comparatively much water is present the affinity of the acid is weakened and most of the ferric salt will precipitate. Nevertheless, all methods for the complete precipitation of the ferric phosphate are based upon the use of sodium phosphate in excess on supposition that the decomposition leads to the formation of acid sodium sulphate and acid sodium phosphate (PO_4NaH_2), in the solution. However, upon this premise it is fair to surmise that since acid sodium sulphate in the first instance dissolved the ferric phosphate largely, it would naturally exert the same action here, consequently the theory is erroneous, and we are justified in taking for granted that free phosphoric acid, in which the ferric salt is insoluble, is alone generated according to the equation:

$$(SO_4)_3Fe_2''' + 3(PO_4Na_2H.12OH_2) = 2(PO_4Fe'''4OH_2) +$$
$$3(SO_4Na_2) + PO_4H_3 + 28OH_2.$$

The ferric phosphate when thrown down from dilute solutions is excessively bulky and gelatinous, and the latter condition renders the washing by filtration tedious and unsatisfactory, whilst the bulkiness and lightness seriously interferes with washing by decantation. Therefore, the writer has always endeavored to precipitate it in the most compact and least gelatinous form. Concentrated hot solutions are very serviceable, in fact the only recourse to meet this end. The writer found an advantage was gained by pouring the strong solution of the ferric sulphate into the hot saturated solution of the sodium phosphate.

But lately the writer has reversed the method and pours the sodium phosphate solution into the iron liquid. With this procedure and the employment of hot concentrated solutions, the precipitate of ferric phosphate is again dissolved after each addition of the sodium salt until over ⅔ of this has been added, when the precipitate will remain insoluble as formed, and rapidly augment upon each addition. The result of this manipulation was a more compact and granular precipitate in which the presence of basic phosphate was totally prevented, in fact it was undoubtedly contaminated largely with the acid phosphate.

$(Fe'''_2\ (PO_4H)_3)$.

The only objection to these precipitates was the slowness of their washing process, which was almost equal in tediousness to that of the gelatinous precipitates, owing to the fact that the water permeated them very gradually although more evenly than the former. Yet if after complete separation the precipitate was mixed with a great volume of water, the method of washing it through decantation applied admirably because deposition occurred speedily and rather compactly.

The writer, although has now abandoned either method entirely, and with a view to save the large waste of phosphoric acid, resorted to an altogether new manipulation, and modification of the general process, which, though not producing exactly normal phosphate, results in the complete precipitation of the iron and utmost utilization of the sodium phosphate, so that practically no loss is experienced, since the precipitate contains all the iron and phosphoric acid, but not as one homogeneous compound, but rather as a mixture of acid and basic salt.

Two important advantages become prominently conspicuous, namely, the economy of the process, which saves one-third of the sodium phosphate, and secondly, the production of a dense precipitate which can be expeditiously washed by decantation and finally pressed between muslin to separate most of the adhering water, without waste to the precipitate; thirdly, the usual large excess of water adhering to the other precipitate is not present here, and therefore the necessary evaporation is avoided.

When sodium phosphate and ferric sulphate are employed in equivalent proportion, and a hot concentrated solution of the former gradually poured into a hot concentrated solution of the latter, the precipitate at first formed is again re-dissolved until nearly all the sodium salt has been introduced, but ultimately after complete mixture only a comparatively small portion of the iron will have been precipitated probably as acid phosphate. If now, however, a moderately concentrated solution of disodic carbonate in equivalent proportion is gradually added to the hot mixture, the iron will be perfectly thrown out of solution as a heavy granular precipitate together with all of the phosphoric acid. Each addition of the carbonate is attended with copious effervescence, and the preliminary formation of a red precipitate, which the excess of hot acid rapidly converts into the light colored phosphate. An excess of carbonate added all at once, however, permanently discolors the precipitate, because basic phosphate, ferric hydrate, and sodium sulphate is produced, leaving the original sodium phosphate in a great measure untouched, but the manipulation, when carefully conducted, yields so little of the basic salt that only a faint yellowish color distinguished this precipitate from the whiter and purer normal orthophosphate. The final phase of the reaction may be thus expressed:

$$(SO_4)_3Fe_2''' + 2(PO_4Na_2H.12OH_2) + CO_3Na_2\ 10OH_2 =$$
$$2(Fe'''PO_4\ 4OH_2) + 3(SO_4Na_2) + CO_2 + 27OH_2.$$

In practice it is necessary to add a slight excess of sodium phosphate and a small deficiency of carbonate to insure a mild acid reaction which will prevent undesirable basic tendency in the ferric phosphate which finally remains.

This precipitate, after solution in the usual proportion of ammonium citrate, yields a greenish solution with a brownish cast, the reddish tint results from the basic phosphate, but if an excess of ammonium citrate is used, the deep green color is developed, since the ammonium citrate extinguishes the brown tint of the basic salts, converting them into the normal green, consequently more citrate is needed to produce the citro-ammoniacal compound with this phosphate than with the use of normal or acid ferric phosphate.

From these observations the writer has constructed the following elegant and expeditious process for the production of a concentrated and absolutely permanent solution of the citro-ammoniacal ferric phosphate:

Take of Ferrous sulphate in coarse powder	8 troy ounces.
Sulphuric acid	1 troy ounce and 200 grains.
Potassium chlorate in crystals	283 "
Disodic orthophosphate, cryst.	11 troy ounces.
Disodic carbonate, cryst.	4 " "
Citric acid, cryst.	4 " "
Ammonium carbonate	sufficient.
Glycerin	4 fluid ounces.
Water sufficient.	

Mix the sulphuric acid with 12 fluid ounces of water, add the ferrous sulphate, and apply heat until complete solution results, then add the potassium chlorate, and stir until dissolved; now dissolve the sodic phosphate in 20 fluids ounces of water with heat and pour this by gradual addition and with constant stirring into the iron solution; then dissolve the sodium carbonate in 4 fluid ounces of water, with heat, and pour this very gradually into the other mixture, stirring this well for a few moments after each addition until the bright red precipitate at first formed has again disappeared; after the final addition continue the heat a few minutes and then dilute the mixture with water to the measure of 8 pints; when the precipitate has perfectly subsided, draw the supernatant liquid off by means of a syphon, and pour on a fresh portion of water in similar volume to the first; after having thus washed the precipitate 3 or 4 times, remove all the water possible by means of the syphon, pour the precipitate upon a muslin strainer, and press it thoroughly.

Upon the citric acid pour 4 fluid ounces of water, and add ammonium carbonate in small fragments until the acid is perfectly neutralized.

Place the washed and pressed precipitate of ferric phosphate in a porcelain capsule, add to it the solution of ammonium citrate, together with the glycerin, and apply a gentle heat until solution is complete; if necessary, mix this with water to the measure of a pint, and strain through muslin while warm.

If the solution of ammonium citrate contained acid salt, or if during the solution of the phosphate, the heat upon the dense liquid had dissipated a part of the ammonia, then after cooling, the solution may separate a crystalline deposite of acid ammonium citrate. Should this occur, the supernatant liquid is decanted, and a few drops of ammonia is added to the crystals at short intervals until perfect solution results in the formation of the exceedingly soluble and noncrystallizable normal ammonium citrate. An excess of free ammonia, however, colors the solution red, but if the excess that was added is not too great the reunion with the decanted portion will again restore the green color throughout the whole solution. A most expeditious method for dissolving salts deposited in the bottom of bottles is to lean the receptacle at an angle of 45°, and change the position of it occasionally, so as to bring the liquid into the most advantageous contact with the mass for favoring its solution.

The ferric phosphate yielded by 8 troy ounces ferric sulphate approaches this in weight, but assuming that it is the phosphate, $Fe'''PO_4\ 4H_2O$, it should by theory only weigh 6 troy ounces and 3.34 drachms. However, the theoretical quantity of the phosphate, $Fe'''PO_4\ 5H_2O$, is 6 troy ounces and 7.48 drachms. Yet if we calculate upon the acid phosphate, $Fe'''_2\ 3(PO_4)H_3$, then only 5 troy ounces and 6.04 drachms should result.

From this comparison it is fair to conclude that the precipitate is the phosphate $Fe'''PO_4\ 5H_2O$, and hence one pint of the solution of ammonio-ferric citro-phosphate would represent about 7 troy ounces of the former compound, corresponding to about 12 troy ounces of the soluble double salt.

EXPERIMENTAL EXAMINATION OF SCHEFFER'S METHOD FOR THE PREPARATION OF PEPSIN.

BY H. SELLDÉN, IN UPSALA, SWEDEN.

TRANSLATED BY CHARLES C. FREDIGKE.

Since the older methods for the production of pepsin are all unsatisfactory, I have of late subjected to an experimental examination the method of *Scheffer*, which is based upon the precipitation of pepsin from an acid solution. In this I followed partly the directions of the author closely, partly modifications of my own, but operated with solutions containing a determined amount of acid, and with quantities exactly weighed and measured, which was not the case with *Scheffer*.

The mucous membrane of two stomachs from hogs was perfectly cleaned and cut in very small pieces. The whole mass, which weighed 200 gramms, was macerated in the cold for 96 hours with one litre of water containing 0.5 per cent. of muriatic acid, and then strained through a linen cloth. The turbid filtrate was set aside for 24 hours, and the strained mass, freed as much as possible by expression from the mother-liquor, and reserved for further investigation. The filtrate was then mixed with an equal volume of a saturated solution of table salt, which produced a yellowish slimy precipitate, separated the following day by filtration and dissolved in 250 c. c: of water, containing 0.5 per cent. of muriatic acid. The filtered solution was again mixed with an equal volume (250 c. c.) of a saturated solution of table salt, and the precipitate then obtained furnished effective artificial gastric juice with muriatic acid. It was found, therefore, that by *Scheffer's* process useful pepsin is obtained. But as different circumstances seemed to show that not all the pepsin is extracted by cold maceration, the above mentioned residuary mucous membrane freed from the mother-liquor was immersed in 750 c. c. of water containing 0.5 per cent. muriatic acid, digested for 1 hour, at 37°, after cooling filtered, and the filtrate mixed with 750 c. c. of saturated solution of table salt. By experiences gained on previous trials, 1 c. c. of muriatic acid (25 per cent.) and a little table salt in substance were added, to promote precipitation. A white voluminous precipitate was produced, which on the following day proved to be very rich in powerful pepsin. This shows that cold maceration does not extract all the pepsin, at least not in four times 24 hours, and that, when a preparation as rich in pepsin as possible is to be obtained, digestion at the temperature of the body is necessary. It is even possible, as further trials have taught, *to obtain by employing digestion double as much pepsin as by cold maceration.* Whether table salt can precipitate all the pepsin is not decided : trials seemed to prove that this is not the case, since the mother-liquor, freed from most of the salt by dialysis, was possessed yet of slight peptic power.

It remained now to determine whether the precipitate obtained by salt is really pure pepsin. It is evident a priori to suspect the contrary for the property of syntonin to precipitate from an acid solution by salt, makes an adulteration of pepsin with this albuminoid probable. To clear up this point, a new trial was made with the mucous membranes of two stomachs, cut in pieces, macerated and treated with salt twice as in the previous case. The pepsin obtained was dissolved in 100 c. c. of distilled water and the filtrate subjected to the following reactions :

Boiling—precipitate;
Alcohol—opalescence, precipitate after several hours;
Sulphate of copper—no precipitate ;
Muriatic acid—gelatinous turbidness;
Tannic acid—instantaneous curdy precipitate;
Nitrate of silver—instantaneous white precipitate soluble in ammonia (probably Ag Cl from the salt contained in the pepsin precipitate);
Table salt—gelatinous opalescence, precipitate after several hours;
Millon's reagent—instantaneous white curdy precipitate, turning red on boiling;
Some drops of alkaline copper-solution—blue-violet coloration;
Boiling with nitric acid—(reaction of xanthoproteic acid), yellow precipitate, color more intense on adding ammonia.

The liquor tested was almost as clear as water and of a distinctly acid reaction. To examine it for syntonin, it was carefully neutralized with a few drops of sodium-hydrate, when a voluminous floccular precipitate appeared, easily soluble in an excess of the alkali.

The pepsin produced according to *Scheffer's* method is, therefore, in fact contaminated with syntonin, and probably also with other albuminoids, which is known not to be the case with *Bruecke's* pepsin, which gives no reactions indicating albumin. This may be irrelevant for practical medical purposes, yet a preparation containing, besides albuminates, inorganic admixtures, is hardly suitable for scientific investigation.

The preservation of pepsin by trituration with sugar of milk is to the purpose, since, according to my own investigations, the preparation will keep unaltered for at least two months. According to *Scheffer* it keeps for a year. It seems to me more agreeable, however, to dissolve the pepsin precipitate in glycerin, by which a permanent, easily dispensed preparation is obtained. My trials of digestion with pepsin from calfs' stomachs according to *Scheffer's* method (with my modification) as well as with pepsin from hogs' stomachs, leave no doubt with me that glycerin excels all other excipients.

Probably the entire mucous membrane might be extracted by glycerin according to *Wittich's* method, without previously macerating in acidulated water and precipitating with salt, and so produce a purer preparation. But in such a case large quantities of glycerin are requisite, besides filtration is greatly retarded by the accompanying mucus, and finally experience teaches that a small quantity of salt does not diminish the digestive power of pepsin, on the contrary, positively increases it. My experiments show that *Scheffer's* method is a good one, when the above mentioned modifications are observed; digestion at the temperature of the body and solution of the pepsin precipitate in glycerin, producing an excellent pepsin for chemical use.

(After a separate print from the Upsala Laekarefoerenings Foerhandl, VIII., H 7.—*Neues Jahrbuch fuer Pharmacie.*)

PREPARATION OF EFFERVESCING LEMONADE WITH CITRATE OF MAGNESIA, ACCORDING TO H. MUENCH.

Into a mineral-water bottle, 9 gm. magnes. carb. with 300 gm. aqua fontana are placed, after which 8 gm. of acid. citric. pulv. are added.

The bottle is rapidly closed with a cork, tied with a champagne-knot, and after shaking, is put aside, standing it on its head. The magnesia is almost entirely dissolved as citrate and bicarbonate of magnesia, because all the carbonic acid generated is chemically absorbed. The mixture keeps for weeks without decomposition. When prescribed, the solution is mixed with 1.25 gm. of elæsacchar. citr. and passed, through a large filter into another mineral-water bottle, which requires ten minutes, after which are added: Syr. simpl .30 gm. and acid. citric. liq. 12.0 gm. (1 part acid and 2 of water), the bottle quickly closed, tied and covered with tinfoil. On opening the bottle the cork flies off with a loud report, the lemonade is perfectly clear and effervesces splendidly.—*Neues Jahrb. fuer Pharmacie.*

REPORT ON THE PURITY OF COMMERCIAL SPECIMENS OF OFFICINAL ACIDS.

BY LOUIS SIEBOLD.

The title of this paper shows that I wish to deal, not with the crude acids of commerce, but with those products which are sold *as pure* for dispensing and analytical purposes. That these so-called pure acids are in many cases far from pure is a fact well known to every chemist who takes the trouble of testing the chemicals supplied to him. To dwell upon the impurities contained in such acids, the means of detecting and removing the same, and the best methods of preparing acids of perfect purity, is the object of this paper.

Hydrochloric Acid.—If this acid is prepared in strict accordance with the Pharmacopœia process, and from perfectly pure materials, it will always be obtained free from sulphuric acid, sulphurous acid, arsenic, iron and free chlorine, which are the main impurities found in the commercial article. If the sulphuric acid used contains arsenic, the hydrochloric acid made from it will of course contain the same impurity; if oxides of nitrogen are present in the former, free chlorine will inevitably occur in the latter, whilst organic matter either in the H_2SO_4 or in the NaCl generally cause the formation of a little sulphurous acid. I need hardly remind you that free chlorine and sulphurous acid destroy one another, and that for this reason they can never occur together. There appears to be hardly any difficulty in obtaining from wholesale dealers and manufacturers hydrochloric acid quite free from sulphuric acid, from sulphurous acid, and also from appreciable quantities of iron (very small traces of iron can be detected in nearly every sample), but arsenic and free chlorine are very frequently found in acids sold as pure; and as arsenic is undoubtedly a most objectionable impurity, however small its quantity may be, it should be carefully searched for, and if found, the acid containing it should be rejected as unfit for dispensing and even more so for analytical operations where its use might lead to very serious mistakes. Boiling a little of the acid with a piece of *pure* copper foil is a very convenient test, and is therefore generally resorted to, but it is not delicate enough for the detection of very small traces of arsenic. I have often been unable to detect it in hydrochloric acid by the copper test when a careful examination with sulphuretted hydrogen proved its presence most unmistakably.

It does not however, suffice to add a solution of H_2S, but the gas must be conducted through the acid until the latter is completely saturated with it. After twelve hours' standing the precipitate which will in any case be formed must be filtered, washed, dried and fused with carbonate and nitrate of sodium; the fused mass dissolved in water, filtered, mixed with pure nitric acid in excess, boiled and then tested with ammonia and nitrate of silver, or with sulphuretted hydrogen. It is impossible to judge of the absence of arsenic from the light color of the precipitate. By the method just described, arsenic will be found in many samples of hydrochloric acid which, if tested according to the directions of the Pharmacopœia, would seem to be quite pure.

Sulphurous acid is readily detected by the Pharmacopœia test, or by iodized starch, the color of which would be destroyed by the least trace of H_2SO_3. For detecting free chlorine, solution of indigo appears to me preferable to a mixture of iodide of potassium and starch, as the formation of blue iodide of starch might be caused by perchloride of iron, which is often present in hydrochloric acid, and which might thus be mistaken for chlorine.

On the strength of numerous experiments which I have made I can recommend the two following methods as the best for preparing perfectly pure hydrochloric acid from the crude commercial article. The first of the two methods yields an acid of low specific gravity (1.120 to 1.125) which, though very suitable for analytical purposes, does not come up to the Pharmacopœia standard of strength. By the second method which was proposed by A. Bettendorff about two years ago, and which I cannot recommend too strongly, a pure acid of 1.16 sp. gr. can be produced with very little trouble indeed.

1st method.—Dilute the crude acid with sufficient water to reduce the specific gravity to about 1.12; saturate it with sulphuretted hydrogen gas, allow to stand for fully twelve hours, decant the clear liquid from the precipitate, drive off the sulphuretted hydrogen by heat and distil after adding a little chloride of sodium.

The sulphuretted hydrogen removes not only the arsenic, but likewise the free chlorine or the sulphurous acid, whichever of the two may be present.

2d method.—Mix the crude acid whose specific gravity should be between 1.16 and 1.18 (not lower than 1.16) with a small quantity of a solution of stannous chloride in hydrochloric acid of the same strength and allow to stand for twenty-four hours. Any arsenic present will thus be precipitated in the shape of a brown powder (which consists of metallic arsenic with a variable amount of tin). Sulphurous acid if present produces a precipitate of stannous sulphide, and is therefore removed along with the arsenic. The filtered acid now only requires to be distilled from a little chloride of sodium, as in the previous process. But as hydrochloric acid of so high a specific gravity parts with a great deal of hydrochloric acid gas on boiling, it is necessary to place a little water into the receiver for its absorption. This method also removes free chlorine if present.

About four years ago a new method of making pure hydrochloric acid from the commercial was published by P. W. Hofmann. According to this, one volume of crude hydrochloric acid is to be mixed gradually with 3½ volumes of strong sulphuric acid in a tubulated retort, and the HCl gas disengaged by the heat produced by the addition of each successive quantity of H_2SO_4 is to be conducted through distilled water in the usual way. Fresenius has proved this method to be quite useless, as neither arsenic nor chlorine can be removed by the same.

In reference to the above method of purifying with stannous chloride, I wish to add that I only recommend it for removing, but not so much for detecting arsenic, as the presence of H_2SO_3 in the hydrochloric acid might lead an inexperienced worker into errors.

Sulphuric Acid.—The chief impurities for which this substance must be tested before it should be used for medicinal or analytical purposes are arsenic, lead, and oxides of nitrogen. Arsenic is best detected by Marsh's test, lead by sulphuretted hydrogen, and oxides of nitrogen by ferrous sulphate. An acid free from arsenic and nitrogen oxides, but containing lead, calcium, iron, etc., may be easily purified by distillation, but if the first-named impurities are present, mere distillation will not suffice. In that case it is necessary to mix one volume of the acid with six or seven volumes of water, and to saturate the mixture with H_2S. After forty-eight hours the clear acid is decanted from the precipitated sulphides of lead and arsenic, evaporated in a retort until fumes of H_2SO_4 escape and then distilled. What passes over first is too weak, and is rejected until an acid of 1.84 sp. gr. distils, when the receiver is changed. To insure a quiet boiling of the acid, and thus to prevent the cracking of the retort, it is extremely useful to conduct a slow current of air, by means of an aspirator, through the acid during distillation. Though sulphuric acid purchased as pure from the most respectable houses is sometimes found to contain impurities, this is by no means the case to the same extent as it is with hydrochloric acid, which it is almost impossible to purchase in a state of absolute purity, whilst there is not much difficulty in obtaining a supply of perfectly pure sulphuric acid.

Nitric Acid.—This preparation can be obtained in a state of the utmost attainable purity by distilling commercial acid of 1.42 sp. gr., and of good quality, with a little absolutely pure nitrate of potassium, from a glass retort. What passes over first must be rejected, until an acid distils which, if diluted with water, forms a perfectly clear mixture with solution of nitrate of silver, remaining clear, too, after standing ten minutes. Not less than two drachms of the acid should be subjected to this test. When thus quite free from every trace of HCl, the receiver is changed and distillation carried on until only about one-eighth of the original bulk remains in the retort. If carried on still further the purity of the product would be endangered, as traces of sulphuric acid might pass over with the nitric. Another method of purifying nitric acid consists in removing the HCl by the addition of solution of the nitrate of silver to the somewhat diluted acid, decanting from the precipitate and distilling the clear acid with a little perfectly pure nitrate of potassium, until about seven-eighths have passed over. The method is good, but is only applicable for preparing an acid of low specific gravity (1.25).

The first method, I feel sure, is the best of all that can be recommended for preparing pure nitric acid of the pharmacopœia strength, and as it presents no difficulties whatever, it is, I believe, the one generally applied. The fact, therefore, that it is almost impossible to obtain perfectly pure nitric acid by purchase seems all the more surprising. It is easy enough to get it free from solid impurities, as mere distillation is sure to remove these; nor is there any great difficulty in procuring it free from HCl, but H_2SO_4 is always present, no matter from whom it has been obtained. Many samples of nitric acid sold as perfectly pure may be quite good enough for medicinal use, but the trace of H_2SO_4 present is always a source of annoyance in medical laboratories where the acid is required for accurate scientific investigations. Whoever requires this preparation absolutely free from H_2SO_4 is obliged to make it for his own use. To detect very small quantities of this impurity in nitric acid, the application of the pharmacopœia test, consisting in the addition of a solution of barium chloride to the diluted acid, is altogether insufficient. About four ounces of the acid to be tested must be evaporated on a water bath until a few drops only are left; the residue is then mixed with a little distilled water and a few drops of solution of chloride of barium. A precipitate will thus be obtained from any commercial specimen of pure acid. If nitric acid containing small traces of H_2SO_4, which do not show on the mere addition of a solution of $BaCl_2$, is neutralized or nearly neutralized with pure carbonate of sodium (quite free from sulphate), the mixture will then turn cloudy on the addition of a solution of a barium salt. It is on this account that the presence of even very small traces of H_2SO_4 is often very annoying to the analyst. The reason that manufacturers do not succeed in producing nitric acid of perfect purity by the method described, is that they do not reject enough of the acid passing over at the beginning, and that they carry on the distillation too far towards the end, and, finally, that they use impure nitrate of potassium. Howard's pure nitrate of potassium, generally considered as a very pure preparation, still contains appreciable quantities of chloride, which must be removed by recrystallization (stirring the solution well during crystalization, so as to prevent the formation of large crystals) before it can be used for the manufacture of pure nitric acid.

Hydrocyanic Acid.—In a preparation like this, the strength must of course be a far more important feature than the purity. The traces of sulphuric acid frequently present seem to be very little, if at all, objectionable in a preparation, the medicinal dose of which is so very small, and which, moreover, is not required in a perfect state of purity for scientific purposes. But the great disparity in the strength of different specimens of this acid is most objectionable and serious, considering its powerful nature. The pharmacopœia requires it to contain 2 per cent. of the anhydrous acid HCN, but my experience tells me that the hydrocyanic used for dispensing in druggists' shops varies from 2 to about a quarter of a per cent., and even less. I have known of cases in which two drachms and half an ounce of the acid labeled Acidum hydrocyanicum PB, have been given to dogs without bringing on the least indisposition. The reason of this is, that the preparation is kept in bottles the stoppers of which do not fit tightly, so that HCN is continually escaping, and can be distinctly noticed by smell without moving the stopper. This is the case with nearly all the common 1 and 2 oz. stoppered blue glass bottles in which the acid is generally kept by retail chemists. How very necessary it is to keep it in bottles with well-fitting ground stoppers, and tied over with bladder or gutta percha tissue, and how very great a change it undergoes even in a short time, may be seen from the following: I purchased a 2 oz. bottle of the Pharmacopœia acid, freshly made, from a very respectable wholesale house, and at once estimated its strength by volumetric analysis. It contained 1.6

instead of 2 per cent. It was kept in the same bottle without being tied over, and the escape between stopper and neck was noticeable at some distance. After 24 hours it contained 1.2, after two days hardly 1 per cent., and after a month it contained only traces of HCN. This explains the great disparity in the effect upon animals produced by samples of the acid procured from different retail establishments. Chemists should therefore either prepare their own hydrocyanic acid, or, at any rate, they ought to test its strength by volumetric analysis or by ponderal analysis with nitrate of silver (taking the specific gravity is altogether insufficient); they should keep it carefully closed, and examine its strength again from time to time, as its preparation may lose in strength, however well it is kept.

In performing the volumetric test, it is important that not more solution of caustic soda should be used than is necessary to produce a distinct alkaline reaction, as any large excess would lead to an inaccurate result, too much of the solution of $AgNO_3$ being then required for the formation of a permanent precipitate.

Not desiring to give this report any undue length, I reserve the consideration of phosphoric acid, sulphurous acid, and acetic acid for a future occasion.—*Read at the Meeting of the Pharm. Conference.—Lond. Phar. Jour.*

CHINESE RHUBARB.

The following notes on Chinese Rhubarb are from a recent report on the trade of Hankow. The writer first refers to the paragraph in Colonel Yule's "History of Marco Polo's Travels," where it is said that "over all the mountains of this province" (meaning Tangut, the modern Kansuh) "rhubarb is found in great abundance, and thither merchants come to buy it, and carry it thence all over the world." The best rhubarb it appears is still produced in Kansuh, but one of the principal marts for the sale of the drug is Sanyuan, in Shensi, in which province also rhubarb is grown to a considerable extent. The cultivation in both provinces has, however, been seriously affected by the Mohammedan rebellion. Much of the rhubarb which comes hither is from Szechuan. It is generally of very common quality, and is quoted in the market at from 5 to 8 taels per picul; the kind known as Shensi being usually quoted at from 15 to 50 taels. A Chinese informant says that the moist heat of the province of Szechuan is injurious to the preparation of the root. In both provinces—Kansuh and Szechuan—the rhubarb is grown in mountainous districts. The plants, when grown, are cut down and thrown in heaps, they are then taken to the farmer's house, where the roots are pared or scraped. In Kansuh, the roots are then tied together and hung up from poles covered with matting, but in Szechuan the roots are obliged to be dried in the sun, and, as a consequence, they are not, like those of Kansuh, of firm substance throughout. The following information on the quality and prices of the different kinds of Chinese rhubarb was furnished by a Hankow merchant:

1. Province of Kansuh, Sining; average of value, say 80 taels.

2. Same province, Liang-chow, very nearly as good; 75 taels.
3. Szechuan, Mien-chow, 30 per cent. worse; 55 taels.
4. Kansuh, Kiaichow, 50 per cent. worse.
5. Kansuh and northwest border of Szechuan, 60 per cent. worse; if well made, 40 taels; if common, 20 taels.
6. Szechuan, Kuan Hien, 60 per cent. worse; better quality, 30 taels; common, 20 taels.
7. The very common, at 5 to 8 taels per picul, comes, as has been said, from Szechuan.

Rhubarb does not come to Hankow from Sining and Liang-chow at present. Very little comes from Mien-chow; the other districts supply the requirements of the market.

The value of the rhubarb exported in 1872 was about £20,600; namely, Shensi, 2267 piculs, value 61,931 taels, and Szechuan, 899 piculs, with a value of 6048 taels.—*London Pharm. Journal.*

A NEW TEST FOR MORPHIA.

BY LOUIS SIEBOLD.

In conducting a series of experiments on organic alkaloids, I discovered a new test for morphia, which greatly exceeds in delicacy the tests hitherto known for that substance. If it is to be applied for the detection of opium in food, the contents of stomachs, etc., in poisoning cases, it is of course necessary to separate the alkaloid from the other substances in the usual manner. The test is then performed in the following way:

Heat the substance which is believed to be, or to contain, morphia, gently with a few drops of pure sulphuric acid, add a very small quantity of pure perchlorate of potassium. The liquid immediately surrounding the perchlorate will at once assume a deep brown color, which will soon spread and extend over the greater part of the acid. Warming increases the delicacy of the test. 0.0001 gramme of morphia can be distinctly recognized in this way and no other alkaloid is acted upon in a similar way by the substances named. It is indispensable, however, for the success of the experiment that the perchlorate of potassium be absolutely free from chlorate; if it is not, it must be heated with successive portions of pure hydrochloric acid until the latter remains colorless and ceases to give off chlorine. After removing the HCl completely by washing with water, the perchlorate must be dried at 212°, and it is then ready for use. I feel justified in strongly recommending this test to the attention of the chemical profession.

[Some time after I had forwarded the above report to the Secretary of the Conference, another equally delicate new test for morphia was published by Mr. R. Schneider. One drop of pure sulphuric acid is placed on a porcelain slab, and a mixture of one part of morphia and six parts of sugar added; the mixture will at once assume a purplish red color, which remains unaltered for some time. Codeine and aconitine, if treated in the same way, produce a similar reaction.]—*Read at the Meeting of the Pharm. Conference.—London Pharm. Journal.*

COLLATED PRACTICAL RECEIPTS.

Oleum Anodynum (Anodyne Oil).—

Take of Aquæ Ammoniæ, part: 1.
Tinct. Opii, U. S. P.
Mixt. Oleoso-Balsamicæ.
Alcoholis aa, partes 3.
Olei Hyoscyami cocti, partes 25.
Misce.

Oleum Acusticum (Acoustic Oil).—

Take of Glycerin, 480 parts.
Camphor,
Oil of Cajeput,
Oil of Sassafras. Of each 2 parts.
Alcohol, 3 parts.
Ether, 1 part.
Mix, and pass through filter.
To be dropped on cotton and placed into the ear.

Elixir ad Longam Vitam (Elixir of Life).—

This is another of these ancient nostrums sometimes called for at the present day. We have dispensed the following as a simple substitute for the numerous and more complicated formulas published.

Take of Tincture of Aloes and Myrrh, 8 parts.
Tincture of Rhubarb, 2 parts.
Tincture of Gentian compound, 1 part.
Simple Syrup, 2 parts.
Alcohol, 3 parts.

Mix. It is not necessary to keep this in stock, as when made by this formula it can be prepared at the time when wanted for use.

PHARMACEUTICAL ASSOCIATIONS AND COLLEGES.

RICHMOND PHARMACEUTICAL ASSOCIATION.

It is with great pleasure that we record the organization of this society, which took place November 10th, 1873. Mr. Hugh Blair presided, and Mr. Joseph N. Willis acted as secretary. Mr. T. Roberts Baker, from a committee appointed at a previous meeting for that purpose, reported a constitution, set of by-laws, and code of ethics, which were read, discussed, amended, and adopted. The object of the Association, as set forth by them, is to cherish a spirit of good faith, to discountenance unworthy competition, and protect members against abuses which exist and may arise; to improve the service and art of pharmacy, and to establish the relations between druggists, pharmacists, physicians, and the people at large upon just principles, which shall promote the public welfare and tend to the mutual advantage of members.

The following permanent officers were elected: President, Hugh Blair. Vice Presidents, John Purcell and Dr. John R. Garnett. Recording Secretary, Jos. N. Willis. Corresponding Secretary, T. Roberts Baker. Treasurer, Henry Bodecker. Executive Committee, The President and Recording Secretary *ex-officio*, R. H. Meade, Powhatan E. Depuy, and John B. Purcell. The Association will meet regularly the second Monday in every month.

TENNESSEE PHARMACEUTICAL ASSOCIATION.

This society held its annual meeting in Nashville, Tenn., on Thursday and Friday, October 9th and 10th, 1873. Quite a large number were present, and much interest was shown in the debates and proceedings. The meeting was called to order by Mr. J. C. Wharton, President, *pro tem*. Fourteen new members were elected.

The following nominations for officers were made, all of which were unanimously elected:

President—J. C. Wharton; *Vice Presidents*—J. G. Rawlings, R. D. McCauly, J. B. Haddox; *Secretary*—Benj. Lilliard; *Treasurer*—R. E. Page; *Committee on Papers aud Queries*—W. G. Ewing, M. C. Currey, E. C. Laurent; *Business Committee*—R. H. Gordon, J. Richards, W. H. Smith; *Committee on Legislation*—W. D. Kline, J. R. Haswell. W. H. Wharton.

The Committee on Legislation were instructed to draft a proposed law, regulating the sale of poisons, in place of the present defective one in force in the State. Copies of the constitution and proceedings of the society were ordered to be sent to every druggist in the State.

Dr. Benj. Lilliard read a paper upon Pharmacal Apprentices.

The Association adjourned to meet in Nashville on Tuesday, May 19th, 1874.

CALIFORNIA COLLEGE OF PHARMACY.

The Annual Meeting of the California Pharmaceutical Society was held on October 9th, 1873.

The following officers were elected:

President—Jno. Calvert; *1st Vice President*—Jno. Newman; *2d Vice President*—A. L. Lengfeld; *Secretary*—J. W. Forbes; *Treasurer*—Wm. J. Bryan. *Board of Directors*—Jno. Calvert, Wm. T. Wenzell, J. G. Steele, J. W. Forbes, H. B. Shaw.

The various retiring officers presented reports, which were accepted. A report was presented on behalf of the Board of Pharmacy by the Secretary, J. G. Steele.

There have been registered, of Graduates, 20; Licentiates, 25; Practising Pharmacists, 81; Assistants, 102; total, 228.

The actions which have been brought for infraction of the law have in every instance terminated in favor of the Board. Every means has been made use of in securing universal compliance with the requirements of the law, without incurring the ill-will of individuals toward the act and the officers of the Board.

Owing to the arduous duties consequent upon the position as Secretary, Mr. Steele has been compelled to resign, and J. W. Forbes has been elected to fill the vacancy.

The financial affairs of the Society are in a prosperous condition.

The meetings are now held in the rooms of the College of Pharmacy, 728 Montgy Street. J. WINCHELL FORBES, *Secy.*

COLLEGE OF PHARMACY OF THE CITY OF NEW YORK.

A stated meeting of the Board of Trustees of the College of Pharmacy of the City of New York was held Oct. 3d, 1873, at which general routine business was transacted. Mr. Otto Gilling was elected member, and Mr. Otto Neustadt proposed as candidate for membership.

The introductory lecture of the 44th annual course was delivered on Monday, Oct. 6th, by Prof. W. D. F. Day, M. D., to a large class of students. Short addresses were delivered by Profs. Bedford and Chandler, and Vice-President Peixotto.

The conversational meeting was attended by a larger number of the members of the College and their friends, filling the large lecture hall.

Prof. Chandler was present and delivered an interesting lecture on Ozone, illustrating his remarks by appropriate experiments.

A quarterly meeting of the members could not take place on the day for which it was called, no quorum being present.

TOXICOLOGY.—A CASE OF POISONING BY ALUM.

BY DR. RICQUET, OF LIEGE.

Mr. V. M., being in the habit of taking epsom salt as a purgative procured 30 grammes of this substance at an apothecary's, and, after having dissolved it in cold water, took it. He succumbed, after atrocious pains. Immediately after the administration of the pretended magnesium salt, he felt a burning sensation in the mouth, throat and stomach, followed only once by bloody vomiting; no movement of the bowels, extreme restlessness, then insupportable anguish, repeated syncope, intelligence and senses intact. Finally, intermittent thread-like pulse and cold skin. Deglutition of liquids was nearly impossible. He died eight hours after having taken the remedy.

On opening the cadavre, a grayish-yellow layer was found, which covered the mucous membrane of the mouth, pharynx and œsophagus; the tongue and uvula were swollen; the stomach, intestines and both kidneys were infected.

Proceeding, then, to chemical analysis, the organs were searched in vain for oxalic acid, arsenious acid and other metallic poisons; but sulphate of aluminium and potassium was found. In the liquors, conveniently prepared, the presence of sulphuric acid, aluminium, potassium and magnesium (magnesium citrate having been adminstered to the patient), and recognized by means of the ordinary reagents, chloride of barium, chloride of platinum, sulphohydrate of ammonia, carbonate of potassium and ammonia sulphate of sodium.

Up to the present time, only one case of poisoning by alum is known, observed by Mr. Taylor, in England, about which, however, we have no details. Orfila mentions another case not followed by death. The observation by Dr. Ricquet is, therefore, the only complete one which science possesses.—*Journ. de Pharm. et de Chim.*, *Oct.*, 1873. From the *Annales de la Societe Medico-Chirurgicale de Liege.*

FRAUDULENT ANTIMONY.

BY KARL CASTELHAN.

I noticed a short time since a very gross adulteration of the so-called black antimony (sulphuret of antimony), or rather an imitation of that drug. The article obtained under this name was nothing but a mixture of sand and pulverized common coal, containing only traces of sulphuret of antimony. There is no difficulty in detecting the fraud at once, by shaking a small quantity in a test-tube with water. The sand, being heavier, settles first, then follow the coarser pieces of coal, while the fine coal-powder floats above. By repeated decantation the coal can be separated from the sand, the nature of which is then easily ascertained.

By cineration it leaves 43 per cent. of a grayish-white residue, consisting of the sand and of the ashes of the coal. Supposing the amount of ashes in coal be 5 per cent., 40 per cent. sand and 60 per cent. coal would give approximately the proportion in which the imitation was performed.

Muriatic acid has scarcely any perceptible effect on it: it dissolves only 4 per cent., while a good sulphuret of antimony should be almost entirely soluble; at least the residue should amount to not more than 3 or 4 per cent.

From eight samples not one proved to be what it was sold for; all were prepared in a similar manner, intermixed besides with small quantities of charcoal, iron-filings, and black oxide of manganese. The quantity of real sulphuret of antimony in one sample was 0.34 per cent., that is, about one grain and a half to each ounce.

That such a drug is entirely worthless is evident. Fortunately its use is very limited. In purchasing, therefore, druggists should beware of such imitations.—*Boston Journal of Chemistry.*

We have received the following: From the Bureau of Education, Washington, D.C., Circular of Information No. 4, 1873, containing a list of publications by members of certain college faculties and learned societies in the United States, from 1867 to 1872. From Prof. Dr. G. Dragendorff, Dorpat, Russia: Die Verfaelschung Ætherischer Oele mit Terpentin Oel, etc., und ihre Erkennung durch Weingeist, 28 p.p. Zur Volksmedicin Turkestans, 77 pages. From Henry B. Brady, F.L.-S., F.G.S., Newcastle-on-Tyne, England: On Archædiscus Karreri; a new type of Carboniferous Foraminifera. Read in the Biological Section of the British Association, September, 1873.

EDITORIAL.

TO OUR READERS.

With the present issue we close Volume VI. of THE PHARMACIST. We do so with the hope, that our efforts to elevate the profession and diffuse useful knowledge have not been in vain. We solicit from you for the coming volume, not only your subscriptions to strengthen its financial condition, but your contributions to its pages of such information as may be useful to the profession.

Those who are in arrears for subscriptions or advertisements, are earnestly requested to delay no longer in remitting, as they will readily understand, that though the amount to them is small, it is not so to us in the aggregate. By so doing, you will ensure to the publishing committee what we wish you one and all—a happy and prosperous New Year.

At the last meeting of the Board of Trustees of the Chicago College of Pharmacy, action on the stamp tax was inaugurated by the appointment of a committee, which will report at an early day.

It is with regret that we record that the publications of Dr. G. C. Wittstein (Vierteljahresschrift fuer Praktische Pharmacie), and that of Dr. F. Vorwerk (Neues Jahrbuch fuer Pharmacie), are to be discontinued with the close of the present year.

The profession can ill afford to lose the publications of these pharmacal savans, who have always wielded a fearless pen in its behalf; and, although at times their writings may have cut like a two-edged sword, it was dictated by an honest conviction and sound judgment in the work of raising the standard and promoting the progress of pharmacy. We hope that they may continue to favor the pharmacal profession with their investigations and writings for many years yet to come. To our colleagues, who wield the editorial pen, we would say, let us continue to emulate the honesty and integrity of a Wittstein and Vorwerk, so that future generations shall honor us by saying, that we have been faithful to our trust, and have done our work well.

As we are going to press, we are in receipt of a Prospectus of the Tennessee *Pharmacal Gazette*, published by authority of the Tennessee College of Pharmacy and the Tennessee Pharmaceutical Association. Benjamin Lillard, Phar. D., managing editor; Thomas Black, M.D., associate editor. A new octavo magazine, to be issued about the middle of each month, commencing with January, 1874; especially designed for the diffusion of practical pharmacal information. Its contents will embrace original, contributed and selected articles of practical value to the profession; notes and queries—comprising useful hints and answers to such questions as would be of general interest;

editorial, reviews of books and publications, and review of the Nashville and New York Drug Market. All books and exchanges received become the property of the College of Pharmacy. Communications, criticisms, reviews and questions on subjects of practical value solicited. Terms—strictly in advance. One copy, $1.25 per year; clubs of five, $5.00; single copies, post paid, fifteen cents The *Gazette* will be mailed free to all members of the College and Association.

THE PHARMACIST herewith extends to this new publication the right hand of fellowship, and welcomes it heartily to the field of pharmacal journalism, wishing for it the success it deserves, its motto being, "Onwards, upwards," and no compromise with fraud and its abettors.

In an article published in the August number we referred to the objections to the use of empirical elixirs, and other preparations of a similar character, which have become so great a burden to the pharmacist that there is almost an unanimous desire to be rid of them, coming as they do from one or more large manufacturers in each of our principal cities, thereby inducing the purchase of preparations which should be made by the dispensing pharmacist.

As an illustration, merely, of the argument, a quotation was given from a daily paper, which mentioned the name of a firm who put up a combination of strychnia too powerful for safe general use. The alleged manufacturers, Messrs. Caswell, Hazard & Co., inform us that *their* elixir of calisaya, bismuth and strychnia does not contain the quantity of strychnia found in the sample analyzed, which statement is verified by a chemist, to whom samples were furnished *by them* for examination. As we have no knowledge of the matter further than the published statements, we cannot tell where the fault lies, but presume there was an unintentional error somewhere.

BOOK NOTICES.

Chemistry: General, Medical and Pharmaceutical, including the Chemistry of the U. S. Pharmacopœia. A manual of the General Principles of the Science and their applications to Medicine and Pharmacy. By JOHN ATTFIELD, Ph. D., F.C.S., Professor of Chemistry to the Pharmaceutical Society of Great Britain, &c., &c. Fifth edition, from the fourth (English) edition by the author. Philadelphia: Henry C. Lea, 1873.

We welcome another edition of this excellent work, not because the former was unsatisfactory, but because it is satisfactory evidence of the fact that it is duly appreciated by the teachers and students of chemistry in this country. Within five years a demand has arisen for five editions of this manual, the present one containing such corrections and additions as seemed necessary to present the science in its latest development—also a re-written chapter, on the general principles of chemical philosophy. We cannot too strongly commend this work to all teachers of chemistry in medical and pharmacal schools. It has no equal. The work of an honest, painstaking author, the statements it contains, may be accepted as the result of practical and extended experience by one who has no superior and but few equals as a teacher of practical chemistry. We especially commend this manual to all students in pharmacy, as being in all respects suited to their wants, and not above the comprehension of the youngest pupil. We congratulate the enterprising publishers on the success met with in this effort, and hope it may induce them to enlarge the production of useful text-books. They merit the thanks of all who are interested in education.

Chemistry, Inorganic and Organic; with experiments by Charles Loudon Bloxam, Prof. Chemistry King's College, London; Royal Military Academy, Woolwich; and in the Department of Artillery Studies, Woolwich; with two hundred and ninety-five Illustrations, from the second and revised English edition. Philadelphia: Henry C. Lea. 1873. 700 pages. Price, cloth, $4.50; leather, $5.50.

We welcome this most excellent and useful practical treatise; it is replete with experiments and facts well chosen and new, and conveying an unusual amount of valuable information. The study of the non-metallic elements begins with Hydrogen, as the chemical unit of the atomic system. English weights and measures, and Fahrenheit thermometric degrees have been employed, and the calculations conducted in the simplest arithmetical form, as being more intelligible to the learner than compendious algebraic expressions.

Special attention is given to the Chemistry of the Metals, the manufacture of Glass, Pottery, and Porcelain, of Building Materials, of Fuel, and of Gunpowder and the various substances employed in warlike stores.

The table of contents is made to serve the purpose of an abstract by which each paragraph of the book can be examined, and the index is also a dictionary of the most important formulæ, as by it the name of a compound or its formulæ may be referred to. The publisher has done his part in the best manner, clear type, good paper, and substantially bound.

An Introduction to Practical Chemistry; including analysis, by John E. Bowman, F.C.S., late Prof. of Practical Chemistry in King's College, London; edited by Charles L. Bloxam, F.C.S., etc. Sixth American from the sixth and revised English edition. 350 pp. Cloth, $2.25. Philadelphia: Henry C. Lea, 1873.

In this new edition the course of qualitative analysis has been revised, and important additions have been made to the practice in quantitative analysis by more explicit directions, which render the operator independent of an instructor. The chapter on Volumetric Analysis has been enlarged and incorporated with the Quantitative Analyses. The weights and measures are given in French and English. The work is well illustrated by ninety-eight engravings, the Appendix contains tables of weights and measures, analytical classification, specific gravities, solubilities of salts, testing tables, and a complete glossary of chemical terms used in the work. The book excels in typography, which is beautifully clear, and is well gotten up by the publisher.

Both of the above-mentioned works are commended to our readers as most worthy of a place in their libraries.

A Manual of Midwifery, including the Pathology of Pregnancy and the Puerperal State. By Dr. Karl Schrœder, Prof. of Midwifery and Director of the Lying-in Institution of the University of Erlangen. Translated from the third German edition by Charles H. Carter, B.A., M.D., B.S.

This manual, which is put upon the market in very creditable style by the Messrs. D. Appleton & Co., publishers, gives, in a very concise and lucid style, a transcript of German Obstetric Art, up to the most recent advances of that department of medicine. In several respects it is much superior to the average obstetric manual. The details of management of the various forms of abnormal labor are fuller, and hence a better guide to the inexperienced or youthful practitioner than is usual in any but systematic works.

The pathology of Pregnancy and Childbed is treated in several well-written chapters, more fully than in works of its class, this department occupying 270 of the 382 pages of the work. The manual proper, of the Art of Midwifery, is sufficiently full, and we notice with pleasure less of the verbiage and arbitrary divisions and iterations concerning presentations and positions, than is usually met with, and which frequently perplex, more than they enlighten, the average inquirer.

As a whole, it is well worth a place in the professional library of the physician, while as a text book for students, it compares favorably with any work hitherto published.

We have received one of each of the following publications from the Department of the Interior, Washington, D. C.: Prof. Hayden's Report on the Geology of Colorado and New Mexico; Prof. Hayden's Report on the Geology of Wyoming, 1870; Prof. Hayden's Report on the Geology of Montana, 1871; Prof. Hayden's 6th Annual Report, 1872; Prof. Lesquereux's Report on the Fossil Flora Survey of 1871; Report of the Supt. of the Yellowstone National Park, 1872; List of Elevations, Miscellaneous Publication, No. 1; Supplement to the 5th Annual Report of the U. S. Geological Survey of the Territories for 1871. From the U. S. Bureau of Education, Washington, D. C., one copy Information of the Bureau of Education, Circular No. 3, 1873. From John E. Koehsel, Chicago, back numbers of the PHARMACIST.

The following public documents have been received from the Secretary of the State of Illinois. House Journal, Illinois, 1867, '69, '71, 7 vols.; Senate Journal, Illinois, 1867, '69, '71, 5 vols.; House and Senate Journal, Illinois, '67, '71; Reports to General Assembly, Illinois, '67, '69, '71, 6 vols.; Illinois School Report, '71, '72; Transactions Department of Agriculture, Illinois, '71; 2nd Annual Report of Railroad and Warehouse Commissioners, '72; Laws of Illinois, '40, '41, '42, '43, '46, '47, '49, '52, '53, '54, '55, '57, '59, '71, '72, '73; Public Laws of Illinois, '71, '72; Private Laws of Illinois, '57, '67, '69; Adjt.-Gen. Fuller's Report, '61, '62; Fifth Annual Report Illinois Industrial University, '71, '72; Annual Report State Treasurer, '72; Third Annual Report on noxious insects in Illinois, '73; Report of the Proceedings of Interna, tional Congress on the prevention and repression of crime, London, 1872; Constitution of Illinois, adopted 1870; 2nd Bi-Annual Report of Illinois Soldiers' Orphans Home, 1871; Thirteenth Bi-Annual Report of Illinois Insane Hospital; Third Bi-Annual Report of Illinois Commissioners and Architects new State House; Thirty-second Annual Report of Illinois Deaf and Dumb Asylum; Report of Commissioners of Illinois State Penitentiary, 1872; Eighth Annual Report of Institution for feeble-minded children; Message of Gov. Palmer to 28th General Assembly; Report of Canal Commissioners, 1872; Synopsis of Senate and House Bills, 1873.

Donations from Allaire, Woodward & Co., manufacturing pharmacists, Peoria, Ill., for the cabinet of the Chicago College of Pharmacy:

Specimens of blue cohosh, wild yam, black hellebore, bitter root, golden seal, crawley root, beth root, blue flag, rosin weed root, yellow parilla, elder flowers, and eucalyptus globulus.

OBITUARY.

F. CRACE CALVERT.

This well-known chemist died on October 24th, at his residence near Manchester, England. He had, while acting at Vienna as juror, contracted typhoid fever, which latterly caused disease of the lungs, and thus closed his career at the age of fifty-three. He was born in London, and studied under the celebrated chemist Girardin at Rouen, and subsequently was a pupil of Chevreul, at Paris. He left France in 1846, and settled in Manchester with a scientific reputation already gained, and shortly afterward was appointed honorary professor at the Royal Institution of that city. For some time, also, he was lecturer at the Manchester School of Medicine. His scientific investigations in hygiene led him incidentally to the useful application and commercial preparation of carbolic acid, with which his name will ever be associated. His process for desulphurizing coke, for sizing cloth, and for the production of aniline colors; and his three series of Cantor Lectures at the Society of Arts in London, showed an immense amount of the technical knowledge he possessed. For some years past he was engaged in investigations upon protoplasmic life. He was a Fellow of the Royal Society, of the Chemical Society, Honorary Fellow of the Chemical Society of Paris, and member of the Royal Academy of Turin and the Imperial Academy of St. Petersburg.

Mr. **George Dymond**, of the firm of Southall, Son & Dymond, of Birmingham, England, died suddenly at the age of 44 years. Mr. Dymond was a prominent member of the Pharmaceutical Society and the British Pharmaceutical Conference. By the death of Mr. Dymond, English pharmacy has met with a great loss.

NOTES

ON

A NEW FORM OF PERCOLATOR,

THE TRIPLEX PILL,

RHUBARB,

ACONITE ROOT,

CITRATE OF BISMUTH AND AMMONIA,

AND ALOES.

BY

EDWARD R. SQUIBB, M.D.,

OF BROOKLYN.

REPRINTED FROM THE PROCEEDINGS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION FOR 1872.

PHILADELPHIA:
SHERMAN & CO., PRINTERS, SEVENTH AND CHERRY STS.
1873.

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NOTE ON A NEW FORM OF PERCOLATOR FOR FLUID EXTRACTS, TINCTURES, ETC.

THE accompanying centre-section drawing of a new form of percolator for fluid extracts, tinctures, &c., is presented to the Association on behalf of the writer's son, Edward H. Squibb, who has prepared it in every detail with care and skill. The drawing is upon the scale of half the linear size required for sixteen troy ounces of substance, and if accepted and deemed worthy of publication in the Proceedings, the scale should be again reduced one-half, so that it may appear in the volume of one-quarter the linear size required for general use. The drawing exhibits the detail of arrangement, but cannot of course show the working management, and therefore two of the percolators are brought before the Association herewith,—one in actual operation upon columbo, and the other empty, so as to show all the parts. These will be placed in the exhibition-room for a closer examination by any who may be interested in them.

The writer has used this form of percolator for about two years, and is confirmed in regard to its practical utility and efficiency. It is a simple and rather ornamental piece of apparatus, and not inappropriate to a conspicuous position in the establishment of the practical pharmacist. The chief merits claimed for it are that it embraces maceration with percolation to any extent that may be desired, and enables the operator to vary the amount of maceration easily during the process;—that it controls the rate of percolation perfectly and easily, and renders the percolation, as nearly as practicable, uniform throughout the mass of substance, independent of the packing; it therefore requires less skill and experience in packing to obtain a given success in result;—that it is economic on material, and as nearly automatic and self-controlling as a piece of apparatus can well be, and therefore requires the least time and attention;—that it is well adapted to repercolation, upon the necessities of which it grew, and well adapted to controlling the results; and finally, that it successfully exhausts substances in coarse powder better than the usual forms, and is thus better adapted to the use of those pharmacists who do, as all pharmacists should, make their own powders.

These claimed advantages accrue from a single simple point or principle in the design of this percolator, namely, the maintaining of all the particles of the substance as nearly as practicable under the same pressure of surrounding liquids, as in maceration, and in so using the gravitation of the liquid in the mass that by its infinitely slow descent it is under the best practicable condition for passing *through* the porous particles rather than *around* them.

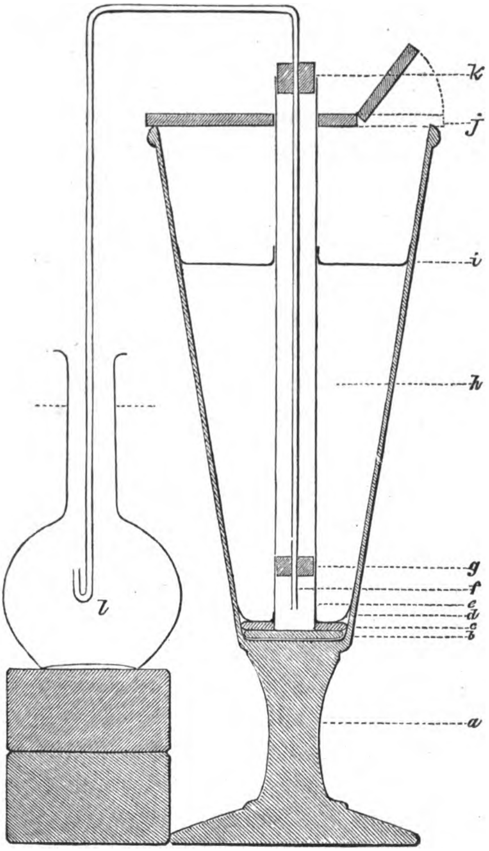
To illustrate this important point, so essential to all forms of percolation, imagine a mass of perfectly porous marbles which have been saturated with a dense solution of sugar, and so dried as to deprive them of all but hygrometric moisture. The problem is to get this sugar out of the interstices of the insoluble marbles. If these marbles be put into a funnel, and have water poured upon them, well-known physical laws will easily enable the operator to predict and explain the result. A small proportion of the water will gradually be absorbed into the pores of the marbles to take the place of that driven out by the drying, and this will more or less completely redissolve the sugar, and refill the pores with a dense solution of sugar. These pores are in the form of small irregular chambers with rough sides, communicating with each other in every conceivable direction through the mass by openings of various sizes and forms. The cohesion between the dense liquid and the sides of the cells and openings is so great as to counterbalance the force of gravitation, and these conditions being undisturbed the cells would remain thus filled indefinitely. Other portions of the water, which is continuously poured on, are deflected by the upper surfaces of the marbles, and are directed by these surfaces into a very tortuous course until they escape from the funnel below; but every particle of this water has had a strong tendency to pass in a straight line from the point where it struck the first marble to the outlet of the funnel below. It therefore penetrates the porous surface of the marble in the direction of this straight line to a distance which is controlled by the amount of its initial or falling force and the resistance and solubility of the surface and the syrup. This force is then divided, one portion being retained by the deflected particle in its interrupted course, and the remainder being distributed to the particles of syrup in the interior of the marble. This force from without destroys the counterbalance between cohesion and gravitation, by giving the balance of power to gravitation, and a downward current is established within the marble. This current is, by density of the moving matter, by friction, and by the length and area of the channels, rendered indefinitely slow, and can only be hurried within the extremely limited compass involved in the keeping of a line of particles behind. All farther supply of water is in excess, and after the surfaces of the marbles are washed free from sugar, and are saturated with particles of water in slow motion, this excess merely serves to dilute the syrup and wash it away as it is slowly pushed through. Thus a copious supply of water would in time wash the marbles free from sugar, but the sugar would be in a very dilute solution.

If, however, the sugar be required in dense or concentrated solution, the excess of water which simply flows between the marbles must be avoided. The outlet of the funnel must be stopped, and only water enough poured on to keep the upper layer of marbles always covered. The sugar will then soon be all in more or less dense solution, the water between the marbles sharing with the marbles the portion of sugar which was on or near the surface. If now the outlet of the funnel be opened so as to allow the liquid to flow out only at the rate of one drop each minute, for example, the laws of hydrostatics require that this rate shall be supplied from every atom of the total contents of the funnel, and hence the movement or current established in all parts of the funnel must be very slow, and by this diminished velocity must be proportionately relieved from friction and increased in power; or in other words, the currents between the marbles are retarded approximately to the same rate as the currents within the marbles, and hence the superincumbent vertical files or lines of particles of liquid are not deflected from the surfaces of the marbles, but pass through the marbles in the straight lines required by the laws of gravitation, becoming more and more highly charged with the sugar until they escape below comparatively undiluted.

In this attempted elucidation of the principles involved in percolation and exhaustion, many disturbing influences and forces are kept out of view, and no accuracy in regard to direction of forces and resistances is attempted, not only because they are not well enough understood by the writer to be properly expressed, but also because they would so complicate the process as to confuse the illustration.

The deduction intended to be drawn from this illustration in its application to the process of percolation is that a funnel, with a stratum of menstruum always covering the surface of the substance, and an outlet so regulated as to maintain a uniform tension of liquid throughout the entire mass of substance, would be *the* perfect percolator. From variation in the fineness of powders, in the solubility of the portion to be extracted, in the character of the menstruum, &c., it is practically impossible to maintain a uniform tension of liquid throughout the mass by any arbitrarily adopted rate of flow from the lower opening of the funnel, and the chief advantage claimed for this new form of percolator is that this uniform tension of liquid can be obtained and maintained by the higher or lower position of the syphon, and that the rate of flow will be spontaneous, and need no other control than the position of the syphon. Not that theoretically perfect results can be attained or even closely approached by this apparatus, but simply that it is perhaps a real and not unimportant advance upon the simple funnel percolator.

The percolator, *a*, is of the form of the more modern glass and tin percolators, somewhat funnel-shaped to allow substances to swell without becoming impacted, but having no particular angle, and no outlet at the bottom, the delivery tube being converted into a solid stem, and this terminating in an ordinary circular foot upon which the percolator is supported. It is made of glass, and in general form and appearance resembles an ordinary celery-glass for the table. The total height is 15½ to 16 inches, or about 40 centimetres,



of which about 4 inches or 10 centimetres is foot and stem. The interior dimensions, to accommodate conveniently an officinal portion of 16 troy ounces of any powder, however light, and a good portion of menstruum above it, is 11½ inches or 26 centimetres deep, 5½ inches or 14 centimetres across the top, and 2 inches or 5 centimetres across the bottom, which should be flat, as shown in the drawing, and not cup-shaped, as the glassblowers are apt to leave it. A rim of glass is made upon the upper edge or lip to thicken it, and this lip is ground off so that the cover may fit accurately to prevent loss by evaporation. The height of the foot and stem is not a matter of indifference, because if too short the receiving flask or bottle cannot be so conveniently changed during the process.

A disk of flannel or blanket, *b*, is cut so as to lie flat upon the bottom, which it entirely covers.

Another disk of the same material, but a little larger, *c*, is made with a crucial incision in the centre, so that it may be stretched over the end of the well-tube.

The central or well-tube, *e*, is a simple piece of glass tube about 12 inches or 30 centimetres long by ½ to ¾ of an inch or 1 to 2 centimetres internal diameter. Over one end of this well-tube the upper disk of blanket is stretched, the end being pushed through the crucial cut so that the disk fits tightly on the tube, the four corners made by the crucial cut being reflected up against the sides of the tube. The disk is then slipped up to the other end of the well-tube, and is tied firmly on to the tube by small twine or thread wrapped around the corners of the disk where they are reflected up against the tube.

A disk of filtering-paper, *d*, larger than the blanket, with a crucial cut in the centre, is cut in toward the centre around the edge so as to lie flat against the sides of the percolator where reflected up against them. This disk of paper is pushed down upon the upper blanket.

If now a piece of paper be twisted around the upper end of the well-tube, or a cork be temporarily stuck into it, the percolator is ready to receive its charge, which is packed in around the well-tube and upon the disks of paper and blanket so as to occupy the lower part of the body of the percolator, *h*.

When the charge, having been properly moistened, rubbed, and sifted, is packed in around the well-tube, its surface is covered by a disk of muslin, *i*, of proper size, and this is held in place conveniently by some fragments of broken glass thrown in upon it. The percolator is then ready to receive the menstruum, or weak percolate, and enough of this should be poured on at once to fully saturate the entire substance. The liquid then passes down like a piston, forcing the interstitial air out through the blankets into the well-tube, whence it escapes freely.

A snugly-fitting cover, *j*, is the next requisite, to prevent unnecessary loss by evaporation. This is very conveniently made from sheet rubber, ¼ to ⅜ inch or ½ to 1 centimetre in thickness. This sheet rubber is sold by all the rubber companies of any desired thickness, and is by them cut to order into disks of any desired size. A disk 7 inches or 18 centimetres in diameter has a hole cut in its centre by means of a wet cork borer, of such a size as to slip easily over the upper end of the well-tube. As it is troublesome to raise this cover every time the percolator is to be supplied with liquid, it may be, by means of a sharp knife, kept wet and directed by a ruler, cut nearly through, so that the uncut part of the thickness serves at once as a hinge and a spring, and permits a part, say one-third, of the cover to be raised without raising the remainder, as shown in the drawing.

The percolator is now charged and in readiness to start the percolation. The menstruum will have passed down through the whole of the substance and will have arisen in the well-tube to nearly the same level as that of the liquid on top, and the entire mass will be saturated and in maceration; and the whole arrangement will represent a well dug in a soil of the wet substance. Now, to pump out that well at a rate no faster, but just as fast, as the saturated liquid passes into it through the porous strata at the bottom, is the final step of the process.

This is most conveniently done by a syphon, *f*, which can be easily raised or lowered through the whole depth of the well. This syphon is made of glass tubing of about ⅛ inch or 3 millimetres bore, bent twice at right angles, the two legs about 12½ inches or 31 centimetres long, and 4½ inches or 11 centimetres apart. The outer leg is a little longer than the inner one, and turned up upon itself for about ¾ inch or 2 centimetres, as shown in the drawing. The legs should have only such a difference in length that the inner one should reach the bottom of the well when required, and when measured upon the outer one should reach to about half the length of the short turned-up portion. This arrangement prevents the entrance of air into the syphon, and thus prevents it from emptying itself, for when the liquid is drawn over by the syphon until the surface falls to the level of the turned-up point at the outer end, the columns of liquid will be of equal length and will counterbalance each other, and the flow will cease. But as soon as the outer level is raised by the addition of fresh liquid the flow will recommence at a rate proportionate to the difference of level. It is this automatic and constant self-regulating action of the syphon that enables the design of this percolator to be carried out in practice, and the facility with which the syphon is raised or lowered in the well gives the operator perfect control over the process.

One or more short pieces of concentric india-rubber tubing, *g*, stretched tightly upon the inner end of the syphon, but fitting loosely in the well-tube, serve to guide the lower end of the syphon and keep it near the centre of the well-tube.

Other short pieces of rubber tubing of different sizes, one over the other, so as to form a soft stopper for the upper end of the well-tube, as shown at *k*, completes the guide by which the syphon is kept in proper position. The inner piece of tubing composing this stopper should be large enough to move freely and easily upon the syphon, while the outer piece should fit the well-tube snugly. Then when the syphon is raised to the desired position and this stopper pressed into the well-tube lightly, it pinches the syphon lightly, but sufficiently to hold it in the desired position and to enable the operator to change the position at will without deranging the apparatus.

A receiving flask or bottle, *l*, marked in the neck or at some convenient place to the measure of a pint, and some wooden blocks to support this receiver at various heights, completes the apparatus. When the mouth of the receiver is left upon the same level as the liquid in the percolator, of course the receiver can never run over, and this is the position to which the receiver should be blocked up when left for the night or for a longer time. The liquid will then accumulate in the receiver more and more slowly, immersing the end of the syphon, until the level approaches or reaches that of the liquid in the percolator, and will then remain at rest, but in readiness to start at any moment when the levels may be disturbed either by a fresh supply of liquid to the percolator or by lowering the receiver.

In order to save space at the top of the drawing, the syphon is represented at nearly its lowest position, a position rarely required except at the end of a percolation when the very last portions of liquid are to be drained off. The position of the syphon is to be regulated by the rate of flow, and the position regulates the rate of flow. Therefore this rate must be arbitrarily adopted in view of the fact that the slower the rate the more effective is the percolation. The rate, upon this scale, should never exceed twenty to thirty drops per minute, or two to four fluid ounces per hour.

When the percolation is ready to be started, that is, after the substance is fully saturated and a stratum of liquid lies above it unabsorbed, the liquid in the well will be found to have arisen nearly to the level of the liquid outside the well-tube. It never rises quite as high within, because this liquid is more dense than the outer liquid, and the column is therefore heavier.

The syphon is then introduced and fixed by the stopper in such a position that the inner end is immersed in the liquid of the well to the extent of two or three inches. The syphon is now ready to be started. The starting is perhaps best done by means of a short piece of small rubber tubing on the end of a longer piece of glass tubing. The rubber tubing should fit snugly over the turned-up end of the syphon, and then by suction with the mouth through the glass tube the syphon is carefully filled from the well. Before slipping off the rubber end of the suction-tube from the end of the syphon, the receiver is to be put in place, so that the first drops from the syphon, as well as those which may have passed into the suction-tube, will fall into the receiver. The rate of flow may be very rapid for a few moments, but will soon diminish to uniformity as the levels become adjusted to the uniformity of the rate of flow. If this rate be more than twenty drops per minute the syphon is to be raised carefully, and a little at a time,—so as not to expose the end above the liquid in the well, and thus allow the air to enter the syphon,—until the required rate is attained. As the rate varies with the varying density of the percolate during the process the syphon is to be from time to time raised or lowered so as to restore it to the desired standard. When exhaustion is practically effected, the syphon is pushed down to the bottom of the well and all the liquid drained off. The exhausted substance may, by care, be then removed, and replaced by a fresh portion, without disturbing the well-tube or disks of blanket and paper, which is a considerable advantage in repercolation, where the same drug is used in successive portions.

The difference in drugs and their menstrua, and difference in the fineness of the powders used, requires a difference in the position of the syphon for every percolation in order to attain a uniform rate. In a few drugs in fine powder, and packed pretty firmly, the syphon requires to be kept down at the bottom of the well, particularly in repercolations when dense weak percolates are used on top, from the very first start, and even then the rate will often be far below the standard of twenty drops per minute. But such percolations are always very successful, and very economical except in the time required. When the powder is very coarse and the menstruum thin and light, the syphon is kept very high, as in the case of the percolator shown herewith, charged with columbo in excessively coarse powder for illustration. A previously exhausted and dried charge of the same coarse powder is also shown, so that the completeness of the exhaustion may be judged by the taste. This portion was exhausted by five pints of diluted alcohol, and the two pints of percolate first received is now used upon the charge in the percolator.

NOTE ON THE TRIPLEX PILL OF DR. JOHN W. FRANCIS.

Many years ago the well-known Dr. John W. Francis used a pill which he called triplex, and which became so popular as to be widely known beyond Dr. Francis's own locality. It originally consisted of equal parts of socotrine aloes, scammony, and mercurial pill mass, in a pill of three grains.

During the latter part of the professional career of Dr. Francis he modified the formula for the then well-known triplex pill, and the modification was generally accepted as an improvement. The pill was then long prescribed by physicians and used by hereditary transmission to families simply as triplex pill, and its composition neglected and forgotten except by the pharmacists who made them, and finally the pharmacist who principally served Dr. Francis before his death alone had the formula.

Some ten years ago, when the writer was serving as a committeeman of the New York Academy of Medicine in preparing a report on the United States Pharmacopœia, previous to its revision, he applied to the son of Dr. J. W. Francis, the present Dr. Samuel W. Francis, for the improved formula of his father, with a view to its republication. Dr. S. W. Francis examined his father's papers, but without finding the formula, but informed the writer that Messrs. Delluc & Co., pharmacists, had made the pill for his father, and continued still to make and sell them. The writer then applied to Mr. Delluc for the formula, but it was refused, and the subject was dropped.

Recently, however, Dr. Samuel W. Francis, in a note to the writer, sends a formula for the pill, saying that he obtained it from Messrs. Delluc & Co., and communicates it for publication.

Although the pill, under the close policy of Messrs. Delluc & Co., has declined in its general use of late years, it is still highly valued by many physicians as one of those happy combinations which grew out of the long experience and fertile resources of eminent men in the profession of past years. When it is remembered how successful these men were in their practice, and hence what a hold upon the confidence of the community they have handed down to the profession of the present day, it does not seem wise to lose or disregard the agencies by which they reached their beneficent results.

The formula for Dr. Francis's triplex pill is as follows:

Take of—

Powdered Socotrine Aloes,	of each	1 troy ounce.
Powdered Scammony,		
Mercurial Pill Mass,		
Croton Oil,		20 minims.
Oil of Caraway,		1½ fluid drachms.
Tincture of Aloes and Myrrh, or Elixir Proprietatis of Paracelsus,		2 "

Mix the ingredients well together by very thorough trituration, make a pill mass, and divide the mass into four hundred pills.

The usual aperient or laxative dose is one pill at bedtime until the natural condition is restored.

NOTE ON RHUBARB.

The New York market for rhubarb, during the past year, has been very abundantly supplied with all ordinary varieties and qualities, and prices have still tended downward, though the actual decline has been small. The usual results of a full and a falling market have been illustrated throughout the year by a small demand, and slow and difficult sales. Prices have ranged from 40 cents to $1.20 for the various grades of quality, the powder being always below the root in price and far above it in appearance, but with the conspicuous absence of any grade of powder which *in price* represented the higher grades of quality in the root. Very handsome-looking "Dutch trimmed" and home manipulated rhubarb has led the market in price throughout the year, and the "handsomer lots" have always commanded "fancy prices" and full profits, while not a single parcel of such rhubarb has been seen by the writer which did not cause a strong suspicion that it was produced from the inferior Austrian, Crimean, or home-grown root. These varieties, and particularly the Austrian, when skilfully manufactured, give not only a fine general appearance or surface of the same color as the fracture, but also give a fine, sound, mottled, compact fracture of good color. In short, the whole commercial character is overdone, and much too good.

Within the past three years it has become a common trade practice, based upon a convenience to the retailer and consumer, to cut up rhubarb root into small squares or slices by means of fine saws.

This convenience is at best of the patent medicine, or ready-made clothing store kind, while the disadvantages do not seem to be considered. This cutting is but a branch of the drug powdering business in disguise, because its tendency is, under the plea of convenience, to remove the landmarks or indications of true quality, and make the drug more difficult to discriminate. If the Mosaic law against the removal of the landmarks was enforced against druggists, there would be less competition in the trade, at least so far as the succession from father to son is concerned.

Well-selected and inspected rhubarb is always accessible to the pharmacist who chooses to buy it at the price of this cut root, but by far the best practice is for the pharmacist to make the selection for himself, and then, if desirable, cut it for himself with a small fine panel or back saw.

The finer grades of Chinese rhubarb, which are now abundant in the market at about $1.20 per pound by the chest, should be had from the druggists at about $1.40 in parcels, of say five pounds. From five pounds of such rhubarb more than one-half, or say three pounds of root, can be selected which is thoroughly well adapted to the use of dyspeptics, or those who require the aromatic and tonic qualities of the finest pieces; while the remainder, including the less convenient pieces from the sawing, is equally well adapted to the more numerous ordinary aperient uses of the drug, and may be easily powdered fine enough in a common iron mortar. Thus the pharmacist would realize from 5 pounds, at $1.40, say 2 to 3 pounds, worth $2 per pound, and the remainder in an unexceptionable powder at whatever cost he may put upon the labor of selecting and powdering.

Without usurping the office of a detective for the rhubarb market, the writer has known of at least four invoices imported within the past year which were entirely and thoroughly worthless. Two of these invoices may have been smuggled in, though the probabilities are against any efforts to smuggle such merchandise. But the other two invoices passed through the custom-house, and were admitted to entry by the proper Government inspectors of drugs. One of these shipments was invoiced at ten pence sterling, and the other at one shilling and three pence sterling, prices which are practically equivalent to twenty and thirty cents gold, per pound, as the foreign cost. Even at such prices these grades are the very dearest of all, because entirely without value. What the ultimate destiny of such parcels may be, it would be curious to know, but such things seem past finding out.

The writer presents herewith, in the exhibition-room of the Association, two cases of rhubarb, which well illustrate this note, and fairly represent the better grades now and during the past year found in abundance in the hands of several of the prominent importers.

The smaller, or half picul case or chest, is from a shipment of forty such chests, which came by the overland route to Messrs. Reed & Co., and arrived unusually sound. Only three or four chests were found to be attacked by worms, and these only to a limited extent. A part of the invoice is flat and a part round, the case exhibited being of the round variety, which has always been the most acceptable to the writer for reasons hitherto given. This excellent rhubarb, which really leaves nothing to be desired in regard to quality, is offered by Messrs. Reed & Co. at $1.10 currency, a price which though not exceptionally low for this grade in the present condition of the market, is quite as low as can ever be reasonably expected for a drug of such quality, and quite low enough to take away all legitimate inducement or excuse for buying lower grades for medical use.

The larger, or picul chest, was imported by the writer through the kind offices and skilful selection of his London correspondents, Messrs. Arthur S. Hill & Son. This also is unexceptionable rhubarb, and though imported at a higher cost, is possibly but little if at all better than the Reed & Co. chest. The members present are invited to a very close scrutiny of these two parcels of rhubarb, and to an independent judgment upon their respective merits.

NOTE ON ACONITE ROOT.

There is good reason to believe that the appreciation of the value of preparations of aconite root in therapeutics, and the increasing use of these medicines are hindered by the want of uniformity in quality of the root as met with in the markets, and by the custom of pharmacists generally of buying by appearance, or what is still worse, buying in powder. The writer has been for some years past almost constantly in search of this drug of proper quality for medicinal use; and has been frequently out of it and its preparations through inability to find it in the markets of the seaport cities of this country, and has even failed to get it in London. Yet if quality be not considered, or not tested, there are few drugs more easily or more cheaply attainable at all times. From the large brown root, which rarely is, though often is called

"English," to the small black root commonly known as "German," the markets are always abundantly supplied with root of various sizes and shades of color. The general appearance is almost always good, and the root clean and sound, and even on fracture, the substance of the root appears to be of fair quality. Upon testing, however, it will often be found that not more than four or five roots in ten have any medicinal activity, and these only in feeble degree. Occasionally parcels will be met with in which every root possesses the desired activity, at least in some notable degree. Thus it becomes necessary to decide upon some arbitrary standard of strength to govern the selection, and in the present state of the markets this must not be set too high, if anything like a uniform supply of fresh preparations is to be kept up. The arbitrary rule adopted by the writer many years ago, was not to buy any parcel from which six roots out of ten did not yield a fair degree of medicinal activity, and to get as much above this as possible. Within the past two years the quality in this market has somewhat improved, and now the arbitrary rule has been changed, and eight roots out of ten from an ordinary handful sample is the standard. If pharmacists generally would apply some such rule we should soon have a market supplied with a much better and more uniform quality, and it is the first object of this note to urge pharmacists to a more careful discrimination, since upon this all uniformity and efficiency in medicinal use of the drug must be based. The root should never be bought in powder, because in the present state of pharmacy quantitative testing would not be applied, and because a proportion of even three or four good roots in ten gives to the powder an apparent activity which is deceptive when judged by qualitative testing.

The causes of this general bad quality of aconite root are, so far as this writer is concerned, unknown; yet two or three prominent causes may be reasonably inferred, and perhaps should be mentioned, in order that the reader may judge of their value.

One of the most probable causes of this condition of the market is that terrible screw of price from which it seems almost impossible to escape. The present ruling prices of aconite root by the bale in this market varies between fourteen and twenty cents per pound, according to the appearance. Now when it is remembered that this includes two or three profits or commissions, the freight and charges inseparable from a three thousand miles transit, to say nothing of the time, capital, and risk involved, it will be seen that the price realized by those who collect and dry the drug for the market, must be very small indeed, and totally insufficient to pay for the requisite knowledge, care, and skill, since two pounds or more of fresh root are required to yield one pound of dry. Hence in order to be sold at so low a price, it may be, and probably is, collected by ignorant women and children, who take it at any season of the year in which they can find it; leave as much of the stalk on the root as they can; dry it in the easiest and most rapid way possible, and then hurry it into the market. Occasionally parcels will be found within this range of prices, which are of good quality, but for anything like uniformity in good quality the common drug market and its prices must be abandoned for special importations to order, at two or three times the common price, and under strict conditions as to quality.

From all this it would follow that if buyers would look carefully to quality so as to recognize it when they get it, and then be willing to pay for it in proportion to its intrinsic value, the markets would respond to their knowledge and true interests in the character of supplies. It is the aggregate buyer who makes the aggregate market, and if so the pharmacist has but himself to blame for the condition of his market. No reasonable probability should escape his thoughtful consideration, and his knowledge and skill should keep pace with the artistic refinements in cunning and deception.

Many parcels of aconite root seen within the past few years, by their partial or entire tastelessness, lead directly to the suspicion that they have been partially or entirely exhausted, and afterward dried and put into the market. There is no doubting the identity of the root, and yet there is no season of the year, age of the plant, nor probable mode of drying, which would yield it totally insipid and devoid of activity, as more than half the roots of some parcels prove to be.

It is now generally believed that the growth of microscopic plants and animals destroys the active principles of many substances, and the published results with solutions of salts of atropia seem to establish the fact for belladonna. If this be true of aconite, then mouldiness would be a cause of inertness, as it is frequently seen mouldy on arriving here, though the appearance of mould soon disappears under the skilful hands of an energetic salesman.

Aconite is a prominent illustration of the general practical fact, that when the drug can be had of good uniform quality, and the preparations from it are made with care and skill, the alkaloid from it is not only a useless, but a dangerous refinement, and becomes through variation of species, or variation of process of manufacture, as deficient in uniformity as the root itself is in commerce.

Aconite leaf and its preparations are comparatively feeble, and the natural and accidental causes of want of uniformity of strength are more numerous, and less susceptible of useful control. The leaf might, therefore, with advantage, be omitted from the Materia Medica.

It now only remains to be shown that there is a simple, practical, easy, and effectual way of testing aconite root by tasting it.

If a root be broken across, near the middle, and a piece the size of half a pin's head be bitten off from the edge of one of the fragments at the place of fracture; and if this piece be chewed between the front incisor teeth, in contact with the tip of the tongue, until it is converted into a pasty or liquid mass, and be then discharged from the mouth, and the parts with which it has been in contact be cleansed as thoroughly as possible by the natural flow of saliva which is produced, the testing process for the particular root in question is finished. If the root be inert, the fragment is nearly or quite tasteless, and no impression remains upon the tongue or lips after the parts are cleansed by the saliva. But if the root be a thoroughly good one, the taste is at once moderately bitter, this bitterness being in a great degree proportionate to the activity of the root.

The bitterness is, however, to a great extent lost when the mouth is cleansed, and there is then an interval of a minute or more of tastelessness. Soon, however, the peculiar and perfectly characteristic aconite impression comes gradually on, beginning with a sense of tingling, which soon becomes a pricking sensation, which passes into a local numbness, which once felt cannot be mistaken. This is not taste, but rather a paralysis of all sensation in the parts, and it is quite persistent, continuing from one to three hours, in proportion to the strength of the root and the quantity taken for the trial. It is not painful nor even annoying, nor is it hurtful when properly managed, but in using the test the virulently poisonous character of the drug should never be forgotten.

Both the taste and the aconite impression or effect will vary in intensity or degree in various roots, but no parcel of the root should be accepted, or be considered as officinal, in which more than two or three roots in ten fail to give the aconite impression or numbness.

If a tasted root fails to give the impression within ten or fifteen minutes, its parts should be laid off by themselves upon the sample paper, and another root may be at once taken. But if the aconite impression be obtained, this must be allowed to disappear entirely before another root is tasted, and the fragments of the good root must be laid together on another part of the sample paper. Thus in testing a good sample of the root, not more than three or four pieces can be tried in any one day, and about three days will be required to determine the quality of a sample of good root. But the testing, of course, is not incompatible with the ordinary duties of the pharmacist, and therefore involve no loss of time. In practice the time mentioned as requisite to test a given sample is almost always exceeded, because in the routine of a busy day the subject is often forgotten for a time, so that but one or two pieces are tried in a day.

NOTE ON CITRATE OF BISMUTH AND AMMONIA.

THIS preparation does not appear to have satisfied the expectations of medical men in this country as a substitute, or even as an alternate for the less soluble salts of bismuth. But yet it does appear to be well adapted to certain uses, and a certain class of cases, and has therefore a permanent standing in the current Materia Medica. As found in the market, however, it is wanting in uniformity of composition, and in readiness of solubility, and the writer is disposed to attribute these differences less to design in the maker than to the process adopted, but chiefly to the plan of drying the salt in scales. In the writer's judgment and experience this method of drying never can yield a very uniform result, and should only be resorted to when no better method is practicable. Its popularity seems to depend chiefly upon the fine appearance of preparations so dried without much consideration for uniformity of result. Hence, although the writer would not seek to change the form of preparations well established in use, which are dried in this way, yet in new preparations would urge the use of any other method that would yield more accurate and uniform results.

Citrate of bismuth and ammonia is a crystallizable salt, the writer having had it in crystals looking not unlike sulphate of potassa in size and general appearance. In drying, even at a very low artificial temperature, the crystals fall into a granular powder. This powder contains 61.64 per cent. of BiO_3 and 37.1 per cent. of citric acid, and is slowly though perfectly soluble in cold water, and easily and quickly soluble in warm water. No salt could be obtained in any other way which would yield over 53.3 per cent. of teroxide of bismuth, and about 52.2 per cent. was about the average obtained by several easily practicable processes, including the process of drying in scales. The scales prepared and sold by Messrs. Rosengarten & Sons, of Philadelphia, gave fully this average, and the only criticism that can be fairly made against this preparation falls rather upon the drying in scales, or the want of uniformity of composition inseparable from this mode of drying. And even this want of uniformity is not very great, generally within 2 per cent. Indeed, it is rather doubtful whether the method here to be suggested, will, upon long practice and in various hands, produce any better results than those obtained by the scale process in the hands of these skilful makers, but it yet may be better in principle and better adapted to general and less skilful use.

Referring to the published papers of Messrs. Bartlett, Ebert, and Markoe, in the American Journal of Pharmacy for 1865, 1866, and 1869, and to the British literature on the subject for all the details, the writer will merely aim to make the points which he has to offer in addition to the published information on the subject.

The insoluble tercitrate of the teroxide of bismuth is not very difficult to make in many ways beside those published, but the salt not unfrequently contains traces of silver, or is in some other way sensitive to the action of light, and carries the sensitiveness on into the double salt. The addition of ammonia to render this citrate of bismuth soluble, and to get this in proper proportion, or in slight excess, is not particularly difficult, but to maintain the proper and uniform proportion through the drying process is less easy, and perhaps is rarely attained. The drift of all recent chemical research seems to indicate that the molecule of all definite chemical compounds is, so to speak, tightly or loosely bound or held together in proportion to the quantivalence of the elements of their composition. Monads make a strong or tight molecule; while triads like bismuth and citric acid form a weak or loose molecule, easily disturbed or split up, and which does not appear to become compact and definite in the presence of an excess of the elements which enter into it. If such excess be avoided the saturations seem more definite and perfect, and the molecule more compact and resisting, or better locked together. For example, citrate of bismuth and ammonia carefully dried with a small excess of citric acid and ammonia forms with its water of constitution a dry scale, whose molecule is so loose that it is easily and promptly soluble in cold water, and the solution decomposes or splits up easily into other molecules, the less soluble of which are liable to precipitate. When there is no excess of either constituent, the molecule seems more compact and more resisting, and takes additional proportions of water much more slowly, but makes a more definite and more permanent solution. Whether this attempt at theoretical reasoning be plausible or not, the facts, so far as the writer's experience goes, appear to be as follows: When a solution of citrate of bismuth and ammonia is made with a slight excess of citric acid, and perhaps a little larger excess of ammonia, a portion of it dried in scales on glass gives a salt which dissolves at once in cold water perfectly. This solution in a few weeks—and the time seems very variable—will deposit an insoluble precipitate. If another portion of the same solution be poured into stronger alcohol, the alcohol being in the proportion of about four-fifths of the total mixture, the mixture being made slowly and with active stirring, the salt is precipitated in the form of a thick, ropy liquid. This settles out of the alcohol, and within twenty-four hours becomes a compact, semi-solid mass at the bottom of the vessel, from which the alcoholic liquid can be poured off clear to the last few drops. This alcoholic liquid now contains nearly all the water from the solution, and appears to contain all the excess of ammonia and citrate of ammonia, and contains a little of the bismuth salt, all of which are recovered by distilling off the alcohol. The semi-solid salt is cut in slices, and then these set on edge upon glass, and dried at the same temperature and in the same way as the scales. These dry and somewhat tough or horny slices are then rubbed to a fine powder. This powder seems to be of a pretty uniform character, varying in composition between 52 and 53 per cent. of oxide of bismuth, and between 36 and 37 per cent. of citric acid; or, in other words, this appears to be a normal, complete, double salt, varying in its hygrometric condition. When added to cold water, even in small proportion, it forms a perfectly opaque, white mixture, from which the larger particles promptly settle out. Indeed, the powder appears to be quite as insoluble as the citrate of bismuth without ammonia, and will be passed at once as an insoluble preparation. On looking at the vessel again in an hour or two, if in warm weather, or in a longer time if the weather be colder, a perfectly transparent solution will be found. If warm water be used this transparent solution is obtained at once. This solution does not appear to be liable to spontaneous decomposition, or splitting into a soluble and an insoluble salt, like the solution made from the scales, but if kept long enough will mould like all solutions of salts made with vegetable acids.

This subject has not been investigated with proper or sufficient accuracy, nor have the comparative experiments been repeated as they should have been, to justify the publication of the statements here made, even in this guarded way. But the circumstances related, and other minor points in the experience of the writer, have been accepted as of sufficient weight to make him discard the scale process for citrate of bismuth and ammonia, and adopt that by precipitation by alcohol, although, as was foreseen, the powder is often returned or complained of as insoluble, and the sales of it are very small and very difficult to effect.

Probably the best practice for the pharmacist is to make and keep, or to buy, the dry insoluble simple citrate of bismuth, and make the solution of the soluble double salt from this as wanted for prescription use, by simple admixture with water, and then the careful addition of water of ammonia until the solution has a faint odor of ammonia, and becomes perfectly transparent. The after addition of a mere particle or two of citric acid to take the trace of free ammonia then completes the extemporaneous process, except the making up to the prescribed or desired measure by water. The process is no more troublesome, nor does it require more skill than the officinal process for solution of acetate of ammonia, and possesses similar advantages in being freshly made as wanted.

NOTE ON ALOES.

A PRETTY close examination and cross-examination of the aloes of the commercial market, during the past few years, has led the writer to the inference that the differences in it are due quite as much to difference in mode of preparation as to difference in species, climate, &c. Comparing the varieties of the market with the uses and effects of the drug, without too much dependence upon the books, it will be found that there are two distinct classes.

Between these classes there seems to be a pretty sharp line of difference, while the individuals of each class shade off into each other without any well-marked boundary line. The prominent, and perhaps characteristic difference between the two classes of the drug is, that in their therapeutic effect one is comparatively mild and gentle, and unirritating, with tonic and aromatic qualities, while the other is more harsh and drastic, producing more irritation, and much more liable to overaction. This difference adapts the individuals of the first class better to use in human beings, and renders a selection for the mildest among the individuals very desirable, if not necessary, in the delicate organization of women, in the treatment of whose diseases this drug is so important and so valuable. The individuals of the second class are better adapted to the medication of animals, and by right should not be used for mankind.

Carrying this therapeutic distinction into the drug market, and applying it closely, the two classes will be easily made out by a marked difference in the sensible properties. The one class is of a lighter color, generally soft, and often semifluid in consistence, and varying in both color and consistence with length of exposure to the air, and with temperature. The odor is entirely different both in quality and degree, being aromatic in quality and feeble in degree. When strong, and approaching to the character of a stench, as it not unfrequently does, this may arise from decomposing animal matter, such as goat-skin, fragments of which are often found in the aloes. From the appearance of these fragments of skin, and fragments of the aloe plants, and from the presence of uncoagulated albumen, it seems almost certain that the individuals of this class have not been subjected to artificial heating, but that the exuded juice is dried in the sun,—perhaps in goat-skins, which line a shallow excavation made in the sand at the stump of the plant, whose leaves may have been cut off near the ground and laid with their exuding, cut ends over the goat-skin.

The second or more drastic class affords equal evidence of being prepared by artificial heat, and the depth of color to some extent indicates the amount and quality of the heat used. Most, but not all, the varieties of this class give evidence of being made by decoction of the plant, rather than by evaporation of juices obtained by exudation from the fresh plant.

All the individuals of the first class are known in the market as Socotrine aloes, or occasionally as East India aloes. While the second class has no generic or class name, but embraces the individual varieties which come from the West India islands, and from Eastern and Southern Africa. This group is well represented by the commercial titles Barbadoes aloes, Cape aloes, &c. And each of the two names mentioned covers, in the market, subvarieties produced neither in Barbadoes nor on the Cape of Good Hope.

While some of the finer varieties of this class are occasionally met with which are very aromatic and very nice, giving evidence of careful preparation, this is so rare an exception that it does not modify the judgment of the writer to the effect that the whole class should be excluded from the materia medica and pharmacy which is specially applicable to mankind, and be confined to the larger uses of veterinary practice where it has special and very important advantages over the other class.

The so-called Socotrine aloes varies quite as much, though all under one name, as the other class with its various names, but of late years there is a growing tendency in the market to separate it into two subvarieties by difference in color, so that it is now not uncommon to hear of Red Socotrine aloes, and Yellow Socotrine aloes, the red variety being justly held in the highest estimation. A curious observation often verified by the writer is that the red variety is always yellow at first, and gradually changes to red through intermediate shades, by age and exposure to the air; and that continued exposure tends constantly to deepen the red color into garnet at first, and finally into reddish-black, when the edges are no longer translucent. The yellow subvariety, however, does not become red by age and air contact, but only deepens, as it dries and becomes brittle, into a yellowish liver color, or yellowish-brown, with very little of the red tinge, or none at all. This yellow subvariety it is in which the fetid, stinking odor is occasionally met with, and as both subvarieties are of the same yellow color at one early stage, even of their drug market career, and at this stage distinguishable chiefly by odor and visible impurities, the question arises as to whether both are not from the same source, and the same process of preparation, the parcels which become red being well and carefully prepared, while the parcels which do not become red, may, from containing putrescible matter, undergo a fermentation which may destroy the elements upon which the red color depends, and other more valuable qualities, as the aroma, &c.

The fetid odor of this subvariety is always diminished by age, and is altogether lost in the powder made from it.

As a general rule this Socotrine aloes is much higher in price than any of the grades of aloes by decoction, and loses much more largely by drying. All except the finer parcels of the red variety require to be melted, diluted, and strained before they are fit for medical use, and the loss by straining varies very much, say from 5 to 10 per cent. It is curious to notice how small a proportion of these impurities is visible by inspection of the aloes beforehand. The average loss from straining and drying is perhaps 15 to 18 per cent , but has, in the writer's experience, once reached 27 per cent. upon a large lot. The substances separated by straining through a sieve of sixty meshes to the linear inch, are chiefly pieces of goatskin, shreds of the aloe plant, sticks, small stones, and hair. A specimen of these strainings is presented herewith. Occasionally entire goat-skins are found in the parcels, and one is here shown tied up at the openings, showing how the juice is transported to the packing places. One outlet—the neck—appears to have been left open, as in the transportation of grape-juice from the wine-presses, through which to pour out the contents. After being emptied—for it was found empty—this skin appears to have been dropped into the package of aloes, possibly by some child, as the skin is smaller than others which have been met with. From another parcel a rude knife of very peculiar shape and construction was strained. This knife, as shown, was probably used to cut off or incise the leaves of the plant, though it does not appear to be particularly well adapted to such purpose for civilized hands. The above figures are given from an experience of straining, drying, and powdering more than twenty-two thousand pounds of Socotrine aloes.

The melting, straining, and drying of the aloes by artificial heat is very injurious to it, of course, as in proportion to the want of skill and care with which this is done, it degrades the aloes to the character of the lower grades made by decoction. But when the question is reduced down to a choice between this injury done and the common practice of drying on steam tables without straining, and thus powdering up goat-skin, stones, sticks, &c., there can be no doubt as to which course is best for the interests of medicine. The finer packages of Red Socotrine aloes, which always command a high price but are slow of sale, contain so little of impurity which can be separated by a No. 60 sieve, that as a rule it is better to use it without this hurtful process. Spread thinly out upon shallow trays of tinned iron, the advisability of straining can be approximately and usefully judged. And if this be done in cold weather when the aloes does not run, and when the air is comparatively dry, a couple of months exposure, at ordinary temperatures, is sufficient to dry the aloes well, retaining its natural aroma to a highly desirable and useful extent. It is very much to be feared that the use of such aloes in the officinal formulas is very much undervalued, since the Socotrine aloes which has passed through the writer's hands within the past ten years has been very nearly all used by successive crops of quack pill men, who must have good drugs while getting up the reputation of their nostrums, though this may not be the time when the money is made. Pharmacists, as a class, use very few such drugs, because not knowing their value they will not pay the price.

A case of very good Red Socotrine aloes imported by the writer from Messrs. Arthur S. Hill & Son, of London, is shown herewith, and will be found in the exhibition-room of the Association during the meeting. The members are invited to make a critical examination of it. This case cost £19 10*s.* per cwt. of 112 lbs. in London. That is to say, about 83 cents gold without freight, duty, or any other element of cost. The currency cost price to the writer cannot be far from $1.20 per pound. It is drier than usual, though not cleaner than the best of its kind, and will not lose in drying more than about 10 per cent., while it does not need straining. Add 10 per cent. to $1.20, and the cost will stand about $1.32 currency. A very high price, but the cost well represented in intrinsic value.

This case, however, is unusually costly, since five cases had by the writer from Messrs. Dix & Morris, of New York, next previous to this shipment, were of nearly as good quality, and quite as clean though not quite so dry, at 75 cents per pound currency.

REPORT

ON THE

NEW OR FIFTH DECENNIAL REVISION OF THE UNITED STATES PHARMACOPŒIA,

TO THE

MEDICAL SOCIETY OF THE STATE OF NEW YORK.

BY

EDWARD R. SQUIBB, M. D.,

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1873.

REPORT

ON THE

NEW OR FIFTH DECENNIAL REVISION OF THE UNITED STATES PHARMACOPŒIA.[1]

To the Medical Society of the State of New York:

As chairman of the delegation sent to represent this Society in the Decennial Convention for the revision and publication of the U. S. Pharmacopœia—which convention met in Washington, in May, 1870—it now becomes the duty of the undersigned to report that the revision and publication of the U. S. Pharmacopœia have been completed; and to present a copy of this new fifth revision to the Society for preservation in its library.

In presenting the completed work, it may be useful to the Society, and is necessary to the writer as one of the Society's representatives in the matter, to direct attention to some prominent points in the new Pharmacopœia, and to ask the earnest, thoughtful attention of the profession to this important subject. If the medical profession does not advance with the rapid progress of other departments of human knowledge and skill, its useful results will be proportionately small, its influence for good will be more and more weakened, and its ranks be more and more demoralized by error and schism. In its struggle for life, inherent strength alone can secure the "survival of the fittest." In order to advance with the rapid progress of other knowledge, it must adopt all the means necessary to that end, and therefore must attain a much higher degree of accuracy in observation and research, as well in the objective as in the subjective branches of medical science.

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[1] Read before the Medical Society of the State of New York, February 5, 1873.

Medical science, as a department of physical science, is thoroughly objective in its character, and very simple and direct in its design, and is of established value and importance; and, if physicians would but take the example of other physicists in the precision and accuracy of their investigations, their ranks would become more orderly and compact as their results became more definite and certain. The element of primary importance to accuracy in observation and research is quality, or greatest attainable perfection in the instruments of investigation. The telescope and spectroscope, the galvanic battery, and the lever and axle to other physicists, fairly represent the materia medica to the physician. And, if the materia medica be not improved in accuracy, precision, and uniformity, as the telescope, spectroscope, and microscope are, the observations made through its agency must continue to be indefinite and uncertain from this cause, and can never rise to the dignity or utility of accurate research.

The new Pharmacopœia having been received within the two weeks just past (February 1, 1873), your reporter can offer but an imperfect and hasty review of it. Nothing can be said as the result of trial and experience of its new processes, and all that is here written is offered as the mere individual judgment of the writer, made up somewhat hastily, but not carelessly. Where this judgment is at variance with that of the Committee of Final Revision and Publication—a numerous committee whose high character is well known—the writer is fully sensible of the weight against him, and of the well-earned advantage such a committee must always have in the minds of careful readers.

In making a report at this time, rather than at the annual meeting a year hence, only a few prominent points can be touched upon in detail; but, it is hoped that even this may not be without use in awakening a new interest in the materia medica, and in attracting special attention to the new Pharmacopœia.

The mechanical execution of the book leaves nothing to be desired. The paper, type, printing, and binding, are highly creditable, both to the committee and to the publishers, and partly justify the increased cost of the book. Both the book and the printed page are slightly larger than the last, but, the type being smaller, though perhaps equally clear, the pages contain very much more matter. Hence, the book with some one hundred and nine additional articles, and twelve dismissed, is still sixteen pages less than the last, or the difference between 383 and 399 pages. The work of the publishers' proof-reader is well done, only one single typographical error having been noticed—namely, on page 125, where "platinum oil" is printed for "platinum foil."

As the convention did not at its last session, as it did at the previous one, direct that the copyright revenue be expended in cheapening the book to the public, but directed that the expenses of the committee should be paid from it, the public has now a better book. It is highly probable that the income from the copyright of the Pharmacopœia might be greatly increased by offering it to the competition of several publishing houses, and all the income which could be thus obtained might be most wisely expended upon—and would most likely pay for—all the expert labor involved in the work. When your reporter served as your representative in this committee in 1860, several respectable New York publishing houses applied to him to have the copyright opened to competition, and given to the highest bidder, and your reporter urged upon that committee both the propriety and justice of this course; but the proposition met with neither favor nor support, and was promptly voted down. The committee, however, decided to seek some information from the publishers bearing upon the value of the copyright; but the publishers declined to furnish the information, because it was connected with their business affairs, and the committee was satisfied with this refusal. It was because of such action as this being not infrequent during the two years' deliberations of that committee—and not from an indisposition to work, and to tell freely all he knew, and to travel a hundred and eighty miles a week to do it—that your reporter persisted in refusing to serve upon the present committee—the committee being substantially the same as the preceding one.

The Pharmacopœia begins with the "Proceedings of the Convention of 1870 for revising the Pharmacopœia. Fifth Decennial Revision." And there is no improvement in the meagre and insufficient abstract of the proceedings of this convention which gives to the work its organic existence and authority. In order that this feature might be improved, the convention directed its secretary to employ a stenographer; but the secretary reported that a stenographer could not be had in Washington at that time. The "Proceedings," however, could have been much improved without a stenographer, if only by the publication of the Report of the Committee of Revision and Publication for 1860—short and meagre as this was for so important a work. In the "Proceedings" it will be seen that the convention discussed the general principles, and adopted a general plan, for the new Pharmacopœia, and then, as usual, appointed a Committee of Final Revision and Publication to carry out the plan thus adopted. Among the resolutions which form this plan for the new Pharmacopœia, as adopted by the convention, for the governance of its Committee of Final Revision and Publication, is the following:

> "*Resolved*, That measures of capacity be abandoned in the Pharmacopœia, and that the quantities in all formulas be expressed both in weights and in parts by weight."

This resolution, with the others which constitute the plan of the convention, was brought in by a committee of five prominent delegates, and was drawn up in the interest of an important degree of progress in precision and accuracy, which had already been attained in the same way by other national Pharmacopœias. The resolution was freely discussed by the convention, and the practical difficulties, and the labor involved in carrying it out, were fairly pointed out and urged, and were fully considered, and the convention deliberately decided that the advantages to be gained in accuracy and precision would be a true progress, and worth the labor involved; and, after this full discussion, the resolution was adopted by the convention.

This action of the convention was considered by the writer, and by others familiar with the subject, as one of the most important steps that could be taken in a general plan to bring the Pharmacopœia up to the date of its revision; and accordingly, when the new issue appeared, this improvement was looked for, but looked for in vain, for the measures of capacity and the weights of the old issue were found unchanged.

The reasons why the Committee of Final Revision and Publication refused to carry out the directions of the convention in this resolution are given in the preface of the Pharmacopœia as follows:

"To execute such directions, entails the use of a metrical system not employed in this country or in England, and which would have to be constructed for the purpose. Such a change would involve changed proportions in almost every formula, and would produce a corresponding disturbance in many of the doses. Moreover, such directions were not anticipated in any of the revisions handed to the committee; and to institute such extended experiment as would cover the whole ground of the directions of the Pharmacopœia, would entail so much expenditure of time, labor, and cost as to render the plan impracticable. This view of the question was unanimously taken by the committee at a meeting consisting of ten members."

These reasons will have more or less weight as they may be viewed by different persons from different points of view. But, how any reasons whatever, can justify a committee in refusing to carry out the deliberate directions of the superior authority by which the committee was created, must be generally difficult to comprehend.

To the perhaps prejudiced judgment of the writer the reasons given appear to be those of a committee which did not like labor, and therefore refused it upon whatever pretext could be found. This, however, fails to account for the action of the committee when it is considered that the time and labor involved were mainly of a mechanical and clerical nature, and might have been hired for the purpose, since the holew value of the copyright of the Pharmacopœia was available, by authority of the convention, to satisfy the cost of revision; the committee-men in this, as in all past revisions, generously contributing their own time and labor entirely without cost to the work.

This much-needed and expected improvement in the national Pharmacopœia is, therefore, lost for the next ten years, unless the committee should see fit to avail itself of the authority given by the convention to issue another revision prior to that of 1880.

The Preface is well and forcibly written, and gives a concise account of the prominent features of this revision. The following admirable paragraph will, doubtless, commend itself to all:

"In accordance wlth the resolutions of the convention, the 'scope of the work has been extended rather than abridged;' and it has been the desire of the committee to adapt it to the wants of our extended country, without losing sight of the conservative character necessarily pertaining to a national Pharmacopœia. Such a work must necessarily follow in the wake of advancing knowledge; it is no part of its mission to lead in the paths of discovery. It should gather up and hoard for use what has been determined to be positive improvement, without pandering to fashion, or to doubtful novelties in pharmaceutical science."

It is, however, unfortunate that an important proportion of the present revision does not correspond to the precept so clearly set forth in this paragraph; as, for example, the introduction of glycerin into thirty-four of the forty-six fluid extracts.

In the summary account of the one hundred and nine additional articles introduced, an excellent opportunity for courtesy if not justice to the British Pharmacopœia was lost, since that standard has been so largely drawn upon by the committee as in some instances to follow its defects.

The Preface concludes with a very slight allusion to the amount and importance of the labors of the committee, which, though quite proper and entirely consistent with the high character and good taste of the gentlemen concerned, conveys to the ordinary reader no just conception of either the character or the amount of work involved in the duties accepted by them in the interest of their professions.

The Preliminary Notices of the Pharmacopœia are found unchanged.

Under the caption of "Temperature," the term "gentle heat" is still defined, while the similar conventional terms "moderate heat," "regulated heat," etc., are still left without definition.

Under the caption "Stoppage of Bottles" it is still insisted that the words "well stopped" whenever they occur must be translated into "glass stopped;" a mode of expression which takes no more words than that for which it is substituted, while it is certainly more clear and definite. The whole force of this Preliminary Notice is that the words "well stopped" must be read "glass stopped" throughout the Pharmacopœia; but the committee itself seems to forget this, and directs two out of the three collodions p. 117, and all the tinctures p. 299, to be kept in "well-stopped" bottles. In the case of the collodions the direction is not simply unnecessary, but will commonly result in the gluing fast of the glass stopper.

The supposed defects of these two captions were brought to the notice of the committee, but without effecting a change.

Percolation, as described in the Preliminary Notices, is substantially unchanged, and the reader might infer that a lapse of ten years had left this important process without noticeable advancement. This, however, is not the true position of the committee, for, on referring to p. 151, a general formula for percolation in its application to the fluid extracts is found in detail. This formula is a modification of that published by Mr. Samuel Campbell, of Philadelphia, in the *American Journal of Pharmacy* for 1869, p. 385, and for 1870, p. 17. By this process Mr. Campbell claims that the medicinal properties of drugs can be practically extracted by a proportion of menstruum, or solvent, much smaller than that indicated by any previous experience. Hence this process attracted the immediate attention of many who were engaged upon the important class of preparations to which it was applicable. The writer, among others, applied it with care, and with that prejudice which is apt to be excited by propositions which, by largely saving labor and expense of material, greatly increase pecuniary profits.

The process in the writer's hands was, however, not favorable in the character of the result. The exhaustions were found to be very inaccurate and imperfect, while these imperfections were often masked by the character of the menstruum employed, and by the deceptive appearances of richness of color and density in the products. Saving of labor and increase of profit naturally hide many defects, and the process soon became popular, though occasionally discredited by pharmacists whose closeness of observation entitled their judgment and their results to respect. This process of Mr. Campbell the committee has adopted, but with the important modification that, whereas Mr. Campbell claims to have his sixteen troy ounces of the drug fairly represented in the first sixteen fluidounces of percolate, and therefore percolates no farther, the committee continues the percolation to twenty-four fluidounces, and evaporates the ten fluidounces last received to two fluidounces, and adds this to the fourteen fluidounces first received. This is a most important advance upon Mr. Campbell's method, but yet, in the writer's experience and judgment, the committee's process is very inadequate, and does not represent the knowledge on this subject at the date of its action.

The Primary and Secondary Lists have been enriched by twenty-seven articles, and would not have been at all impoverished, to say the least, by the omission of an equal number, yet only five articles were dismissed. That view or plan of "extending rather than abridging the scope of the work" which forbids the dismissing of such articles as Absinthium, Allium, Althea, Cataria, Coccus, Hæmatoxylon, Matricaria, Salvia, Sambucus, Santalum, and Statice, from the Primary List, together with most of the articles of the Secondary List, does not seem to the writer to be in accordance with the condition of medical and pharmaceutical science at the date of this committee.

The committee of 1860 ventured so far as to dismiss thirteen of the ancient incompetents of the Secondary List; but the present committee, unable to withstand this sacrifice, have restored two articles then dismissed, as "Substances added to the Materia Medica of the Pharmacopœia." These are the Flesh-colored Asclepias, and the Syriac Asclepias. What these particular "milk-weeds" have done for the materia medica within the past ten years your reporter does not know. The only other addition to the Secondary List is Castanea. As far as the name is concerned, this also is a restoration. But, in reality, the Castanea dismissed by the committee of 1860 was the bark of the C. pumila or Chinquapin, while the Castanea now added is the leaf of the C. vesca, or common chestnut. This has, within the past ten years, been occasionally noticed as an efficient remedy in whooping-cough.

The other additions to these Lists, which are only restorations—or the undoing of what the former committee did—are the readmission of Cinchona, which was dismissed as a useless generic name, since all the useful varieties were separately described; the readmission of Conium Seed or fruit, which the committee of 1860 made a great blunder in dismissing; and the readmission of Origanum, which, if important now, this importance has escaped notice in the current literature of the past decade.

A very important advancement has been made by the committee in the direction of greater precision of language in the officinal description of drugs. What, at first sight, would appear to be but a mere change in the form of expression, or a mere multiplication of words, or technicalities, upon closer inspection exhibits a far deeper meaning, and will contribute much toward precision and accuracy. As an illustration of a change, which, though apparently trivial and useless, is yet not so in reality, the word "saturation" has, throughout the book, except in two or three instances, been changed for "neutralization." When it is remembered how the word "saturation" is now applied in chemistry, the change will not appear trivial. On the other hand, the word "sufficient" seems to have found an Anglo-Saxon disfavor that is really trivial. With the exception of a few instances, where the enemy must have been napping, it is ruthlessly eliminated, in favor of the word "enough;" but this only in certain positions of the phraseology, for, in the expression "a sufficient quantity," which occurs so much more frequently, it triumphantly holds its place.

The descriptive notes of characteristics and tests, appended to the articles throughout the book, are much improved and extended, and those applying to articles newly introduced are as full and as effective as is practicable. The only serious error in these is under the article Acidum Carbolicum Impurum, p. 11. On next to the last line of the page it is stated that this substance "should not be soluble in less than 20 per cent. of water, thus indicating that it is not an alkaline solution of carbolic acid." This is probably intended to be Crooke's test, which is, in effect, that it should not be soluble in less than five times its volume of water. Besides the extension in both the definitions and notes, several errors of the previous Primary List are corrected in this new List.

At the outset of this Primary List is noticeable the most conspicuous and most general of all the changes made by this committee. This is the change in nomenclature which, as the Preface states, has been made "in order to place the work in accord with the progress of chemical science."

Here the effort to hold back, and to be conservative, and yet to go on a little, very carefully, seems to have led the committee into a jumble in which chemical science could see no accord. The frequent use, in the same paragraphs, of the old and new nomenclatures, often in their most abrupt contrasts, produces upon the writer the effect of a harsh discord, and must prove to be confusing to physicians and pharmacists; while to those familiar with the new nomenclature the effect must be absurd. This jumble, which pervades the whole book, has its culmination in such names as "Tartrate of Antimony and Potassium." Nowhere is true conservatism more valuable than in an authoritative standard which should govern the every-day practice of arts so important as medicine and pharmacy; and the frequent apparent success of ill-judged, half-way measures, adopted under the name of conservatism, shows how great a load of error can be carried by the little giant truth. If this partial change proves to be an error of judgment of the committee, a weakening of the influence of the Pharmacopœia is to be feared as a consequence. Within the sphere of the Pharmacopœia, the new chemical nomenclature may be considered to be pretty well settled for the next decade, and it would have been a manly policy for progress, to have adopted it entirely until a better one might be developed. It has been well said that the workers in the fields of natural science must hold their facts and occupy their positions as the nomadic Arabs do their tents, in readiness to pick up and move on at any time; and, if this be true, it indicates that neither the new nomenclature nor any other can be stable for the future, and that the question of stability need not therefore have embarrassed the committee, to prevent it from taking an advanced position for its decade. On the other hand, the committee might—certainly with safety, and probably more wisely—have decided to retain the past nomenclature for another decade, until the committee's constituency might, from other sources, have become more familiar with that advanced knowledge of which the new nomenclature is but the natural language. But, to adopt neither, yet attempt both, impresses your reporter as a grave error of judgment.

After this great change in nomenclature, it seems puerile to refer to others which, but for this, would be very conspicuous. The words "folia" and "leaves," which ten years ago were changed to "folium" and "leaf," so as to be in harmonious uniformity with "radix," "root," "semen," "seed," etc., are now changed back again to the plural, while "almond," "cubeb," "fig," "nutmeg," "bone," "egg," "prune," etc., are retained in the singular. The words root and bark are omitted from the English translation of many of the officinal titles, and we now read "Quercus alba, white-oak. The inner bark of Quercus alba." "Rubus, blackberry. The bark of the root of Rubus Canadensis, and of Rubus villosus;" and "Apocynum cannabinum, Indian hemp. The root of Apocynum cannabinum." This brings them into harmonious accord or uniformity with "Cinchona," "Ipecacuanha," "Jalap," "Valerian," etc., but the changes do not appear to advantage when, in the subsequent formulas, we read "Take of Blackberry, in fine powder;" "Boil the White-oak," etc. In "Slippery-elm bark," however, the word "bark" is retained in the English name, probably through oversight. The change, or rather the exchange of the names of the officinal alums, seems to have been unnecessary, and, if so, is unfortunate and bad, since it introduces confusion while in no way promoting accuracy, and simply caters to a common usage which is based upon inaccuracy. The name alum was not commonly applied to any thing but potassa-alum until after ammonia-alum had been more cheaply made from gas-liquor. Potassa-alum has always been the type and file-leader of the class of alums, as ethylic alcohol is of the class of alcohols, until the committee degraded it and promoted its younger usurping competitor. Had the committee promoted fusel oil, or glycerin, to the name of "alcohol," and degraded ethylic alcohol to the ranks in chemistry, rating it by its chemical constitution simply, this would have been but an exaggerated instance of a similar change. All the past medical reputation of "alum" belongs properly to potassa-alum, the ammonia-alum being comparatively untried till introduced into the last British Pharmacopœia as "Alumen," to the exclusion of potassa-alum.

A general view of the next subdivision of the Pharmacopœia, and the most important part of it, namely, the "Preparations," shows it to be, except in the points already noticed, mainly unchanged. The same array of long and yet insufficient, and now also long obsolete, formulas for Calomel, Cinchonia, Quinia and Morphia salts, etc., is still found, though the advisability of transferring all such to the Materia Medica List, with appropriate descriptions and tests, has been long and earnestly urged by many competent judges here, and has been illustrated by the example of foreign Pharmacopœias. It is really very difficult to know where to draw the line between processes appropriate to practical pharmacy and those which are not; but it must be drawn somewhere by the authority of the Pharmacopœia, and to do this with the least practical inconsistency is what should be aimed at. Hypercriticism never ends, and can neither be well defined nor avoided; but, to refuse logical inferences, and resist reasonable conclusions on account of this, cannot be wise.

It is to be regretted that saffron, an excellent corrigent and stomachic, is omitted from such preparations as vinegar of opium, tincture of rhubarb and senna, and compound tincture of cinchona. The general appreciation of its value, in the latter preparation especially, will not be likely to support this change.

An error in the process for vinegar of squill, which was pointed out soon after the revision of 1860, and has been repeatedly noticed by various authorities since, remains uncorrected, although the process has been rewritten by this committee.

The process for purified chloroform has been rewritten and considerably changed, and the standard of purity has been lowered from "s. g. 1.490 to 1.494" to "1.480." Perhaps, all that the writer should say, in regard to this change, is to enter an earnest protest against lowering the standard; and that, from a considerable experience in the purification of chloroform, the old formula was a very good one, and the changes entirely unnecessary.

The officinal dried alum is now directed to be made from ammonia-alum; the maximum temperature is lowered from 450° to 400°; and the dried ammonia-alum is left with more water in it than the dried potassa-alum, formerly officinal. These changes are taken from the British Pharmacopœia, and therefore the committee adds that high authority to its own against the individual judgment of your reporter.

The process for benzoate of ammonia is taken nearly *verbatim* from the British Pharmacopœia, but the appended descriptive note is much more full than that of the British Pharmacopœia. The reasons for the introduction of this article into the Pharmacopœia are not known.

Bromide of ammonium, p. 83, is an important addition, and the process appears to be a very good one as an outline for any one who wants to make it. The last paragraph on the page is not clear—or at least is not understood by the writer—for, if no greater precision is attained than that indicated in the process, there will be more than two-tenths of a grain of moisture left in the salt, and then the seventeen grains of nitrate silver will decompose the whole of the bromide, and the further addition of nitrate-of-silver solution will cause no cloud.

Purified chloride of ammonium, p. 84, is also a useful addition, but the process is defective in adding the water of ammonia to a hot solution of the chloride, and in continuing the heat before filtration. Upon the large scale, at least, this does not accomplish the object, and the preparation will not, in a large majority of instances, stand the test by tannic acid, as given in the paragraph of tests.

Iodide of ammonium is another important addition.

The article on valerianate of ammonia, p. 85, has been rewritten with no perceptible advantage; but the note of description and tests, which is far more important, and is deficient in not identifying the separated acid, is unchanged.

In the process for oxysulphuret of antimony, p. 88, 7th and 8th lines from the foot, the phraseology is changed decidedly for the better.

Under carbonic-acid water, p. 90, an important paragraph is added to prevent insidious contamination with copper and lead, though the tests given would detect these metals as well as others if present.

Under water of ammonia, p. 91, the phraseology is altered for the worse on the 15th and 17th lines from the top, since, if the phrase be grammatically construed, the "glass tube," and not the distant "two-pint bottle," is described as containing the water. Such points, however, would be surely hypercritical, except when they are the only changes, and changed from a better phraseology to a worse.

Creasote water, p. 94, should be filtered through a *wet* filter to prevent the passage of oily particles.

Under distilled water, p. 95, the new Pharmacopœia adheres to the phraseology of the old, where the direction is, to "distil two pints, using a tin or glass condenser, and throw them away." Query, what is to be thrown away? This peculiar phraseology was pointed out to the committee, so that it must be concluded that they consider it correct as it stands.

The processes for subcarbonate and subnitrate of bismuth, pp. 103, 104, are somewhat changed and much improved in several points.

The process for animal charcoal, p. 109, is amended materially by the direction, before omitted, to "heat it to redness, and, when cool, keep it in well-stopped bottles," but, unfortunately, this important amendment needs further amendment, for, unless the words "out of contact of air" be added after "heated to redness," the charcoal may be burned up.

The name of "Ceratum adipis, cerate of lard," is now changed to "Ceratum, cerate," p. 109. And Unguentum adipis, ointment of lard," to "Unguentum, ointment," p. 326. At the last revision, these were, with rather doubtful propriety, changed from simple cerate, and simple ointment, to lard cerate, and lard ointment. But now, apparently to get them into harmony with "Syrupus, syrup," and "Mel, honey," they are again changed, so that the adjective, or qualifying, or class name, stands by itself. But, as the other parallel class distinctions, such as decoction, infusion, solution, spirit, tincture, etc., could not with propriety be used in this way, the discord is still as great as ever. The physician, who follows the Pharmacopœia, but sends to a pharmacist who does not know it critically, may have his prescription returned to him as incomplete. The change seems altogether uncalled for, unnecessary, and unwarranted.

The class "Chartæ," comprising two articles, is new. All the blistering and mustard papers now commonly used are, so far as your reporter's information and inquiries go, untrustworthy, and, where such things fail, valuable time is often lost. The cantharides paper is taken, with slight modification, from the British Pharmacopœia; and the mustard paper is probably that of Mr. Crew, or something like it. If from these sources, and materially modified, the modifications may make them keep well, as the original preparations do not. At best they may be best classed with those "doubtful novelties of pharmaceutical science" which the Preface tells us the Pharmacopœia should not pander to.

The Pharmacopœia cannot be followed in keeping two out of the three collodions, p. 117, in "well-stopped," that is glass-stoppered bottles, unless an almost impossible degree of care be taken not to get the collodion upon the neck of the bottle or stopper to glue the latter in. A cork, when glued in, can be dug out in pieces and a new one substituted; with glass this is more difficult.

The previous errors in the process for the confection of senna are properly corrected, and the formula and process are now unexceptionable.

The formula and process for digitalin are introduced with slight modification from the British Pharmacopœia.

In the officinal names of several of the alcoholic extracts, the characteristic word "alcoholic" is left off, as in those of aconite, arnica, colocynth, digitalis, etc., thus making the names harmonize with those of the watery extracts, while they are really equally alcoholic with those of belladonna, conium, and hyoscyamus, where the word alcoholic had to be retained to distinguish between the more feeble watery extract of the fresh plant and the stronger alcoholic extract of the dry plant. Even to physicians and pharmacists, who are pretty well educated in the materia medica, this distinction has not been fully learned and appreciated in the past, and, now that a new and serious element of confusion has been introduced, it will be fortunate if grave mistakes do not occur.

Extract of American hemp is introduced, and is, so far as the writer knows, entirely new to the professions of medicine and pharmacy. A single monograph, written by Dr. H. C. Wood, Jr., of Philadelphia, contains all the knowledge on the subject; and, adopting the principle laid down in the Preface, the new Pharmacopœia follows in the wake of this single beam of "advancing knowledge," to gather it up and hoard it for use.

The formula for compound extract of colocynth is very much improved by taking purified aloes and an increased proportion of cardamom, but is still defective in mixing the separate powders instead of combining them by heat so that the soap, resins, and aromatic, may unite and form a compound rather than a mixture.

The extract of jalap, p. 143, still contains the expensive, inert, useless, and very troublesome watery extract, which more than ten years ago was taken in boluses large enough and repeated often enough to determine its character, and that by one of the members of the present committee. The committee seems persistently to refuse this as "advancing knowledge;" but in the parallel case of the extract of podophyllum, p. 146, gives a very much improved formula and process excluding this watery extract.

The extract of Calabar bean, p. 145, is an important addition, but the substance is taken in too coarse a powder, and the exhaustion is insufficient.

Under the important sub-head of fluid extracts, a model process of percolation is first given. At the last revision model processes were rejected, first, upon the ground that in a book of reference, like the Pharmacopœia, each article referred to should be found complete; and, again, as a more intimate knowledge of the characteristic peculiarities and differences in drugs was obtained by investigation and experience, it was considered that no model process could be equally applicable to any considerable number of substances. Increasing knowledge and experience seem to have justified these conclusions of the last committee, yet the present one has reversed the action.

The revision of 1860 contains 25 fluid extracts, all of which are retained in this revision except that of conium. Of the 24 retained, 10 contained sugar. This ingredient proved objectionable in practice, and the writer among others soon found that where sugar was desirable glycerin was far better, and these results were freely published, and glycerin was fully tried, though not always with the expected advantages. Nevertheless, wherever sugar had been considered indispensable, there seemed no doubt but that glycerin was better, and the writer everywhere advocated the substitution, but never its extension to other fluid extracts. Within the past two years, the practice of pharmacists and the usage by physicians both seem to indicate that, where glycerin is not absolutely necessary, it is objectionable. Such views are, however, not accepted by this committee, for, in following out their modification of Mr. Campbell's plan for the officinal fluid extracts, they have not only substituted glycerin for the sugar in the 10 old fluid extracts which contained sugar, but have introduced it into 7 of the remaining 14 old fluid extracts after ten years' experience had proved it unnecessary, leaving now only 7 of the original 24 without it. Then the committee introduce 22 new fluid extracts, 17 of which contain glycerin, thus making a total of 46, of which the large proportion of 34 contain glycerin. This new officinal feature will not probably be generally followed and should not, and the Pharmacopœia will have to be satisfied with that degree of loyalty which adopts its now uniform strength for fluid extracts whereby each minim represents a grain of the drug from which it is made. Some other curious changes are unaccountably made in both old and new fluid extracts whose present value has been long established.

The process for tartrate of iron and potassa, p. 178, is not corrected, and it is therefore still impracticable.

Citrate of iron and strychnia, p. 179, is a new article of some importance, and the process seems to be a good one.

A new class of glycerites, p. 187, is introduced apparently from the British Pharmacopœia, since four of the five are found in that work. This may prove to be a useful class of preparations for external application.

In the formula for yellow oxide of mercury, there is an error which defeats the process, and yields oxychloride. The quantity of solution of potassa should be twenty-five troy ounces, instead of seventeen, p. 193.

Aconite liniment, p. 205, is also a useful addition, but it is in reality a fluid extract both in mode of preparation and in strength, and why it should be introduced here, as a liniment, it is difficult to understand, unless it be to secure it against internal administration. If this be the reason, it is not a good one, for the Pharmacopœia cannot wisely undertake to legislate against mistakes by erratic names.

The errors of directing purified chloroform in the chloroform liniment, p. 207, and in the solution of gutta-percha, p. 215, are still retained, though a commercial chloroform is provided for external uses.

The formula and process for soap liniment, p. 207, are reformed and very much improved.

An important alternative process is given for solution of acetate of ammonia, p. 208, which must prove to be a great advantage as well as a convenience, since it will always be freshly made as dispensed. It might have been wisely substituted for the old process.

A solution of chloride of iron, p. 211, is introduced, which is but the first part of the old process for the tincture of the chloride of iron, and then this solution is directed, at p. 208, to be used in making the tincture. This is simply making two preparations out of one, and, if the intention be to keep the materials separate, and make the tincture as wanted, it is a mistake, because the older the tincture is the better, on account of the reactions which take place slowly for the production of an ether which is important to the preparation.

The process for solution of citrate of iron, p. 212, is rewritten, and materially improved.

The one-grain solution of sulphate of morphia is still retained, while an officinal formula for Magendie's solution is still refused. If local usages are to be provided for in simple solutions, both should be supplied. If confusion and mistakes are to be avoided, both should be excluded, and be left to magistral prescription.

The process for chloride of zinc, like that for tincture of chloride of iron, is divided into two, and a solution of chloride of zinc is introduced at p. 223.

A citrate of lithia is very properly introduced, and by a good formula.

The processes for the oleo-resins are all rewritten, and improved; and a new one, oleo-resin of fern, meaning male-fern, is introduced.

Under the sub-heading of pills, p. 241, the Pharmacopœia is made again to depart from the admirable precepts of its Preface, and to illustrate how different it is, and how much more easy, to know a thing to write it, and to know a thing to do it. It cannot be too often quoted that the Pharmacopœia "should gather up and hoard for use what has been determined to be positive improvement, without pandering to fashion, or to doubtful novelties in pharmaceutical science."

Now, it is stated here as a mandate of this highest authority in the nation, that "the practice of sugar-coating pills is approved in reference to pills which are expected to be slow in their operation, but is of doubtful propriety in regard to those intended to act quickly, as the coating retards the solution of the pill-matter in the liquids of the stomach." When the Pharmacopœia thus goes half-way over to the wholesale pill-makers, the first question is, as to whether sugar-coating be a positive improvement which should be gathered up for use. If it be so, then the question of "pandering to fashion, or to doubtful novelties" in the drug-trade—for this is not pharmaceutical science in any sense—does not come up? If it be true that medicines commonly go into an empty stomach, and that when the organ is empty it is but a quiescent portion of the intestinal canal which would at once pass a bland, unirritating particle, like a sugar-coated pill, through the pylorus, the question of sugar-coating being a positive improvement must be considered as decided in the negative. But there is another aspect to this subject, which is of greater importance. Is the medical profession ready to hand over to the tender mercies of competing tradesmen another important class of medicinal agents, with the full knowledge that in so doing they must of necessity lose all check and control over it, and therefore must abandon all notions of precision and accuracy. In these cases we cannot afford to wait for evolution to determine the survival of the fittest, for the faithful manufacturer who may use the best materials and put on the most soluble coat with greatest skill cannot sell at the same price or profit as his less faithful competitor, nor can he spend so much upon agents and advertising; and, the landmarks of quality being all removed, the whole question is left open to that most precarious of all testimony, namely, individual judgment based upon casual observation.

Such changes as that made in the alums, the lowering of the specific gravity of chloroform to the trade standard, and this partial approval of sugar-coated pills, subject this committee to the charge of concession to the unsafe interests of trade in matters of vital importance.

The formulas for pills have all been rewritten with much care by a practised hand, without material change in proportion or dose, and are made to apply to small quantities applicable to the wants of dispensing pharmacists, so that they may always be comparatively fresh and soft. This, to a certain extent, obviates the necessity of adding glycerin to the formulas, to keep the pills from becoming hard. The tone and tendency of these changes is quite in opposition to the indorsement of sugar-coated pills, and will go far to induce the dispensing pharmacist to make his pills for himself. And, if this be skilfully done, there is no necessity whatever for sugar-coating. It is to be regretted that this practised hand, which worked out these formulas, did not add the direction that pills should be kept in bottles.

The matter upon p. 249 of the pills, seems to be out of its proper alphabetical order, without any other discoverable reason than that the masses are not divided into pills as all the others are. This dislocation, however, renders these formulas liable to be lost when sought for by alphabetical order.

The processes for two of the resins are rewritten, with great improvement and advantage.

The British Pharmacopœia process, sometimes known as Redwood's process, for spirit of nitrous ether, is adopted instead of the old one. The writer has never tried this process, but feels confident that an error is involved in the use of sulphuric acid and copper. It is, however, much more certain that a grave error has been made by the committee in the quantity of stronger alcohol taken, and the quantity of the resulting product. Had the committee copied their authority more literally, they would have escaped the great blunder of making seven or eight pints of the spirit from "four troy ounces and a half" of nitric acid. These proportions yield a preparation of about one-half the strength it should be, and must be, in order to answer the requirements of their note of tests. The writer having made thousands of pounds of this preparation with great success by the old formula, and repeatedly upon the scale of the Pharmacopœia, is at a loss for any reason for this change in this important preparation.

In the formula for suppositories of lead and opium, the oil of theobroma is left out, p. 287.

Heat is still very mistakenly insisted upon in the process for syrup of iodide of iron, p. 291.

Tincture of aconite leaf is dismissed, though called for perhaps quite as often as many of the articles introduced, while it must necessarily be kept by the pharmacist, to fill those prescriptions which call simply for tincture of aconite.

Notwithstanding all that has been written at home and abroad, the committee seem to be only one-quarter converted to the advantages of the dried, unripe fruit of conium over the leaf. They advance so far as to admit the fruit, and make the fluid extract from it; but still make the extract, alcoholic extract, p. 138, and the tincture, p. 307, from the leaf; and besides, introduce a bad new preparation, juice of conium, which they also make from the leaf. Why they refuse such authority as Dr. John Harley, of London, especially as it is supported by abundant testimony at home, your reporter cannot understand.

In the troches of bicarbonate of soda, nutmeg is found in the formula, but not in the process. Which is in error?

In a new preparation, ointment of cantharides, introduced at p. 328, is a curious instance of novelty. Two cerates are mixed, and called by the committee an ointment. How the mixing can change and reduce the consistence, as implied in the name, is difficult to understand.

The old defective process for acetate of zinc is abandoned, and a good process is adopted in its stead.

The tables usually found at the end of the preparations, giving a summary account of all the changes made, are increased in number by one; and six new tables of weights and measures have been added. These give the officinal and metrical systems, and their common and most useful relations to each other, and their approximate equivalent values. In giving the value of the gramme in grains, the later and more correct determinations are not accepted by the committee. The equivalent given by Gmelin, "Handbook," p. ix., from authorities of that date, is 15.44242 grains. This determination was subsequently corrected to 15.4346, and again to 15.4340 as given in the U. S. Dispensatory. But the value generally accepted at this time, as the result of greater precision in the weighings, is 15.4322 grains, as determined by U. S. authority in the Bureau of Hydrography in Washington. The new Pharmacopœia gives 15.434.

The convention of 1860 directed that the Index of the

Pharmacopœia should "have its names so marked for the quantity of the syllables that it may serve as a pronouncing vocabulary of the materia medica." This was well done by the former committee, and your reporter can attest the utility of such a standard for reference, to correct the many common errors of pronunciation against which this provision was made. It is to be regretted that the present committee did not allow this index to stand, even with its very few doubtful renderings. At the present revision, the index is merely accented, thus leaving the *c* and *ch* to be rendered either hard or soft though the *g* is marked, and leaving the vowels entirely unmarked for quantity.

In a retrospective view of the materia medica for the past decade, it will be seen that the number of articles proposed and used, and the voluminous and inconsistent testimony in regard to them, are unprecedented; and hence it must appear, to the most casual observer, that the work of the committee in selecting articles for admission was unusually difficult and laborious. This difficult work the committee has accomplished with a judgment so generally good that exceptional instances become the more conspicuous. As an instance of this exceptional character, they introduce the hypophosphites, now pretty well worn out, and pretty generally rejected, though still possibly entitled to the place; but reject pepsin, which stands so very much in need of a pharmacopœial description and tests.

Your reporter here gives up the disagreeable and tedious labor of having so much of this important national standard to object to. It is a work at which he hesitated and halted, and it never would have been undertaken but from a sense of paramount duty. He therefore begs a few words of personal explanation in concluding the disagreeable task.

Let no man infer from what has been here written that the writer places himself in an attitude of hostility to the United States Pharmacopœia; or that he in any degree withdraws any part of the influence he may be able to exert from earnestly supporting it. On the contrary, if he knows his own position in the matter, it is that of unchanged, honest, earnest fidelity to the National Standard, and unchanged disposition to work for its improvement.

NOTES

ON

FLUID EXTRACT OF SENEGA,
CANTHARIDES AND A BLISTERING LIQUID,
OFFICINAL EXTRACT OF JALAP,
RHUBARB,
PAREIRA,
LITMUS PAPER,
COMMERCIAL BICARBONATE OF SODA,
AND CHLORAL.

BY

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NOTES.

NOTE ON FLUID EXTRACT OF SENEGA.

The officinal process for fluid extract of senega has, in the writer's hands, generally proved unsatisfactory. Occasionally a good stable preparation has been obtained, but this was so exceptional that it is now regarded as an accidental result of either defective senega root or a defective percolation. The more common result of the officinal process has been a speedy deposit of polygalic acid, and the gelatinization of the preparation in cold weather. Thus, after several years of experience, the conclusion was reached, that if the senega was good, and the process carefully managed, an inconvenient impracticable preparation must result from the formula of the Pharmacopœia. As it was one of the most important and useful of the fluid extracts, it could not be given up, and therefore the writer sought to amend or improve the formula, and with such success after a year's practice, as to warrant the publication of the amended process. The difficulties to be overcome seemed to lie entirely with the menstruum. This would extract the polygalic acid, but would not hold it in permanent solution, and extracted too much of the useless pectin and perhaps other inert matter. After many trials of mixtures of alcohol and water, and alcohol and glycerin, in many proportions, it was found that the addition of ammonia to the menstruum enabled it to hold the polygalic acid in permanent solution; and it was next determined how small a quantity of ammonia would effect this object. Increasing the alcoholic strength of the menstruum of course effected the other object of rejecting or excluding the pectin. In this way the following menstruum was reached and adopted, and nearly a year's practice with it on a moderate scale, seems to confirm its utility.

This menstruum is a mixture of one hundred and sixty parts (by weight) of Stronger Alcohol, eighty parts of water, and one part of Aqua Ammoniæ (specific gravity, 0.960). The specific gravity of this menstruum at 15.6° C. = 60° F. is 0.894, and a pint of it at this temperature weighs 6516 grains. At 10° C., a pint weighs 6548 grains, and at 21° C., 6485 grains. When this menstruum is used by repercolation upon three successive portions of sixteen troyounces or 7680 grains of powdered senega, the differences between the weight of a pint of the menstruum and the successive pints of the percolate, at the same temperature, are, for the first portion of 7680 grains, 474, 267, 145, 92, 47, 19, 14, and 12 grains. For the second portion of 7680 grains, repercolated with pint after pint of this first percolate, the differences in weight between the menstruum and the successive pints of the second percolate at the same temperature, are, 617, 362, 252, 212, 152, 119, 92, 102, 94, 64, and 29 grains. For the third portion of 7680 grains, repercolated with the second percolate, the differences are 642, 462, 434, 314, 264, 197, 157, 130, 103, and 75 grains.

The residue of powder after being dried weighed, first portion, 4500 grains; second portion, 4560 grains; the third portion having been imperfectly exhausted was not dried for weighing. Then 7680—4500 = 3180 grains as the amount of extract obtained from the first portion, and 7680—4560 = 3120 grains from the second portion.

In practice with these slow and therefore effective percolations, it is found that even when the funnel-point passes well within a narrow-mouth bottle, as it should, there is always a considerable loss of the more volatile portion of the menstruum from the surface of the liquid on top, and from the extended surface of the slowly falling drops, so that in all percolation there is a progressive concentration or inspissation of the liquids, which varies much with the season of the year or temperature, but which is always very considerable, and particularly so with strongly alcoholic menstrua. This to a certain extent multiplies the effect of repercolation and exaggerates the differences of the later series. Thus by other and much larger processes than that above epitomized, it is found that the normal difference between the weight of a pint of the menstruum, and a pint of well-made fluid extract, representing the drug in the proportion of minim for grain, is not much over 490 grains, while the first three pints of the last series of differences if mixed would give an average difference of 512 grains. But if five-sixths of this first three pints of the last of the three percolations be taken as the portion which pretty accurately represents the drug in the proportion of minim for grain, the difference will be still greater, and in a very slow percolation has been known as high as 660 grains. These considerations seem to warrant the conclusion that a safer and more uniform practice with fluid extracts in general, would be to make them by weight exclusively, as the nearest practical approximation to accuracy. If uniformity of quality in the drug could be secured there would be no great difficulty in securing fair practical accuracy by either measure or weight, or by both together. But so long as it happens as a practical fact, that no two lots of the same drug correspond in quality with any great degree of accuracy, it seems superfluous to aim at a greater degree of refinement or accuracy in the fluid extracts.

If it be remembered in connection with the state of the drug market, that no matter how rich or how poor a drug may be, it must be put into the procrustean bed, and be made to yield the pint of fluid extract from each 7680 grains of powder, the importance of the exclusive use of either weights or measures will not appear so great. The writer is in the habit of seeing good lots of many of the common drugs—senega, for example—which do not yield within two to five per cent. of the same quantity of extract to the same management; and he finds no difficulty in practice, of obtaining a uniformity in results within such limits as this either by weight or measure.

The position was taken in a paper published last year upon "Fluid Extracts and their Menstrua," that on an average fluid extracts should perhaps contain 80 per cent. of the extract which the drug is capable of yielding to the given menstruum. Farther experience, however, seems to indicate that no general standard such as this can be adopted, but that each drug must supply a standard for itself, and that an average cannot reach so high a figure as 80 per cent. And farther, and still more important, that the proportion of extract contained in a fluid extract is not always a measure of its activity in use, nor of the proportion in which it represents the medicinal properties of the drug from which it was made.

NOTE ON CANTHARIDES AND A BLISTERING LIQUID.

In a recent revision of the Army Medical Supply Table, the writer was consulted upon the adoption for army use of some of the various blistering-papers, tissues, or plasters, which appear to be so convenient in use, and thus so well adapted to a military organization. Upon careful inquiry, however, it appeared that all these tissues were liable to deterioration under unknown conditions; and that any such want of permanency overbalanced the advantages, particularly for army outposts, where supplies could not be frequently renewed. The tissues were therefore abandoned for the present; but it was thought by the writer that a blistering liquid might be made by taking advantage of the more recent researches upon cantharides, which would give better promise of permanence. Blisters have, in the condition of the patient, and of the surface to which they are applied, and in the degree of skill with which they are applied, so many elements of uncertainty, that it is highly important that the substance used for blistering should be in itself as free as possible from uncertainty. Under different conditions of the patient, a thoroughly active blistering substance may vesicate in four hours, or in seven or eight hours, or may not vesicate at all; and in case of delay or failure, the time is always lost, while it is generally impossible to know whether the cause of delay or failure be in the patient or in the blistering substance.

The general drift of recent observations seems to point to two principal causes of uncertainty in blistering agents. First, the almost absolute insolubility of the active principles of cantharides in ordinary menstrua; and second, the liability of these active principles to become inert, or to fly off in some volatile combination.

The change which takes place in cantharides and its preparations seems somewhat analogous to that which occurs in ergot, and it therefore seems not unlikely that it may be controlled in the same way as that so successfully applied by Prof. Procter in the officinal fluid extract of ergot; that is, by fixing the active principles in new and more permanent combinations.

The important investigation of cantharides in 1852 by Prof. Procter, has served as a basis for many able researches, and notably those of Fumouze, and of Massing and Dragendorff, in 1867, and Delpech in 1870, so that now the older labors of Robiquet and others are rather matters of history than guides in practical application.

In an attempt to utilize still further the labors of these recent writers on cantharides, it was determined to make a solution of cantharidin in some convenient menstruum better than collodion, and to make this so strong as to be as nearly certain as possible. A hundred and twenty pounds of good cantharides was freshly powdered, and the powder carefully assayed yielded the full proportion of 0.466 per cent. of cantharidin. Twenty pounds of this powder very thoroughly exhausted by sixty-eight pounds of chloroform by percolation, and the chloroform recovered by distillation, left a black, oily residue, weighing twenty-eight ounces, avoirdupois. This, while warm, treated repeatedly and copiously with bisulphide of carbon to remove the oily matters, left a residue of very light-colored cantharidin, which in proportionate quantity came but little short of the assay. The bisulphide of carbon distilled off should have left the oily and waxy matters free from cantharidin, but upon trial on the writer's arm, this oil proved to vesicate most promptly and actively. Another portion of this oil, separated from the cantharides in another way, proved equally active. Supposing this activity to be due to its still holding some cantharidin in solution, the oil was repeatedly heated and washed with a solution of potassa so dilute as not to saponify the oil, yet strong enough to render the cantharidin soluble, and to wash it out. Still the oil blistered as actively as before, and the writer was thus forced to the conclusion either that this oil held a portion of the cantharidin too obstinately for easy practical separation, or that the oil itself was vesicant, and therefore that the cantharidin was not, as heretofore believed, the only active or vesicating principle of cantharides. This latter explanation is that which the writer is now inclined to accept in preference to the former.

Rejecting the oil and its vesicating properties, however, it was next sought to get the cantharidin into a definite solution which could be made uniform and thus far trustworthy. A variety of menstrua were tried, including most of those which have been commonly suggested, and glycerin and chloroform and their mixtures in addition. None of these proved to be sufficient solvents, or properly applicable, thus realizing the observations of Prof. Procter as to the peculiar intractability and unmanageable nature of this substance when separated. Many of the cold solutions were vesicant, but all appear to be sluggishly so, and much less active than the oil. These trials all seemed to strengthen the conclusions of Massing and Dragendorff that cantharidin is an anhydride, which in combination fixes two equivalents of water, and then plays the part of an acid to alkaline bases. The salts thus formed are far more soluble than cantharidin, and are soluble in other menstrua, but these solutions are still very dilute when saturated, and appear feeble and sluggish in vesicating effect when compared with the activity of the oil. All this inclined the writer, after much labor, to go back to the beginning, and by the light and general drift of these trials, seek for some definite liquid representative of the crude drug like a fluid extract, wherein the active principles, as in fluid extract of ergot, may be rendered more fixed and permanent by new combination. After preliminary trials of various menstrua for exhausting the powdered cantharides, the officinal diluted alcohol, containing one-sixteenth of its volume of officinal liquor potassæ, seemed to succeed well. But when the liquid obtained and the residue after exhaustion were tried, the first was found rather sluggish in action, and loaded with an unnecessary amount of inert extractive matter, whilst the residue produced some irritation of the skin, and persistent itching after eighteen hours' application.

After standing three weeks, the liquid was covered with a film of wax and fatty matter, and had become turbid. All this was accepted as evidence that the menstruum did not contain sufficient potassa and alcohol, and a new menstruum was made containing one-eighth of its volume of Liquor Potassæ, one-eighth water, and three-fourths Stronger Alcohol. This menstruum applied to the powder by repercolation yielded a percolate, which when in the proportion of a minim for each grain of powder, was very active in producing vesication. Even when diluted to one-half this strength, its action was energetic and prompt, producing a blister in less than six hours. This percolate contained no free potassa, and the alcohol appeared to be in sufficient proportion to hold all the oil in solution. On standing exposed for some days it became turbid, and a film of waxy matter formed on the surface. This turbidity and waxy matter did not disappear on the addition of alcohol unless the liquid was heated. The percolate was miscible with water and with alcohol in all proportions, but with turbidity from the separation of waxy matter, with perceptible separation of oil. This percolate was accepted as the blistering liquid sought after. It is really a fluid extract of cantharides in the normal proportion of minim for grain, and as an example of how fluid extracts may be made by weight, and without measures, the formula by which it is practically made will now be given.

FLUID EXTRACT OF CANTHARIDES OR BLISTERING LIQUID.

Take of—

Cantharides, in fine powder, . . .	16 troyounces.
Solution of Potassa, Stronger Alcohol, Water, ...	of each a sufficient quantity.

Make a menstruum consisting of two troyounces and thirty-two grains (= 2 f℥) of Solution of Potassa, and four troyounces and three hundred and twenty grains (= 6 f℥) of Stronger Alcohol, to moisten the powder with.

Make another menstruum with which to percolate, consisting of 6¼ troyounces of Solution of Potassa, 6 troyounces of Water, and 28 troyounces of Stronger Alcohol. Divide the powdered cantharides into four equal parts, and moisten each part as it is wanted for percolation with one-fourth of the first menstruum. Then percolate the first part to exhaustion with the second menstruum. Reserve the first troyounce of the percolate from this first part, and receive the remainder of the percolate in separate portions of about two or three troyounces each. Repercolate the second part of the moistened powder with the percolate from the first part, excepting the reserved portion, and follow the percolate from the first part with about two troyounces of new menstruum. Reserve three troyounces of the first of the percolate from this second part, and separate the remainder of the percolate in fractions as before. Repercolate the third part of the moistened powder with the percolate from the second part, excepting the reserved portion, and follow the percolate with fresh menstruum as before. Reserve five troyounces of the first of the percolate from this third part, and separate the remainder of the percolate in fractions as before. Repercolate the fourth and last part of the moistened powder with the percolate from the third part, excepting the reserved portion, and follow the weak percolate with fresh menstruum to exhaustion as before. Reserve five troyounces of the first of the percolate from this fourth part, and separate the remainder of the percolate in fractions as before, to be carried on to a future process. Add the reserved portions of percolate together, and mix them as the finished fluid extract. When a new process is to be undertaken, four troyounces of the powder is to be treated in exactly the same way as each of the above parts, and three and a half troyounces of the first part of the percolate is to be reserved as finished fluid extract, and the remainder of the percolate is to be carried on to a future operation as before.

A pint of the first menstruum, at 25° C. = 77° F., weighs 6520 grains, and a pint of the second menstruum, at the same temperature, weighs 6482 grains. A pint of the finished fluid extract, at the same temperature, weighs 6850 grains, or 14 troyounces and 130 grains. The normal difference for this lot of powdered cantharides is therefore $6850 - 6520 = 330$ grains.

The officinal Liquor Potassæ always contains lime and silica, which are precipitated upon admixture with alcohol, and these weights will vary from these figures if this precipitate be left in the mixture. As the officinal Liquor Potassæ contains about 5.8 per cent. of hydrate of potassa, and as each fourteen troyounces of the fluid extract contains about two troyounces and thirty-two grains of Liquor Potassæ, it follows that the total quantity of hydrate of potassa represented in the fourteen troyounces is about 57.5 grains or 0.85 per cent. This is, however, entirely saturated by the cantharidin and by the oil, and is present in the fluid extract as cantharidate of potassa and as a soap, both being held in perfect solution by the alcoholic menstruum, the turbidity on standing and by dilution consisting of inert matter in inconsiderable quantity. The only thing which appears undetermined in the preparation is its permanence. All the published researches on this point and all the analogies that are available, however, are in favor of its permanency, and as it proved very prompt and effective when reduced one-half in strength, it has a very good margin to secure its certainty.

It is therefore believed to be an excellent fluid extract of cantharides, and available for all therapeutic uses of the drug, internal as well as external, while it is both convenient and economical. It is, of course, an active poison, and should therefore bear a red label, and be dispensed with due care. As it can only be needed in small quantities, it should be put up in one and four ounce bottles.

For internal use it may be diluted to any desired extent, and may be given in any simple vehicle.

As a rubefacient, or mild and continuous counter-irritant, it may be added in very definite proportion to plasters, cerates, ointments, liniments, &c., to obtain any desired degree of effect.

As a vesicant, it is perhaps best applied by means of thin bibulous paper, such as common filtering-paper or newspaper, covered by oiled silk or adhesive plaster. One minim of the fluid extract sufficiently moistens one square inch of such paper, and this is a good proportion in use,—a fluidrachm for an eight inch blister, for example. The paper should be cut of the shape and size required, and a piece of oiled silk or oiled muslin, or a piece of common adhesive plaster, of the same shape but larger size, should be cut as a covering. The paper is then folded upon itself several times, and while lying on the middle of the oiled silk the fluid extract is dropped upon it until the paper is just thoroughly moistened or saturated, so that none of the liquid can drain out and spread over more of the surface than is desired. If it be accidentally or incautiously wetted too much, a few minutes' exposure will remedy this, by the evaporation of the alcohol. Paper thus moistened may be entirely dried, and be preserved for use in the dry state, to be moistened with water as required for use, but although likely to be more permanent, as shown by M. Delpech, than any of the common blistering tissues, its permanency has not yet been ascertained. It is therefore, for the present, considered better and safer to keep the blistering substance in the liquid form, and to moisten the paper with the liquid as it is required for use. This paper, thus moistened, is simply applied to the skin and covered with the oiled silk. In dispensing a blister of this kind, it is simply necessary to wrap the folded moistened paper up in the oiled silk, and then the whole in paper, with written directions for the simple mode of application. The skin should be cleansed from secretions before the paper is applied, but this is less necessary with this than with the ordinary forms of cantharides, because the active principles are here in a far more soluble condition. Of course, some means must generally be taken by bandage or by light compression to keep the paper in contact with the skin. A gentle pressure over the oiled silk for a few minutes, until it becomes warm and soft, will cause its margin to adhere to the surface around the paper, and usually this will be all that is needed. Narrow strips of adhesive plaster or isinglass plaster or a bandage may occasionally be required. Three to five hours' contact is generally sufficient to produce full vesication, but the cuticle will not generally be raised into a blister for six or seven hours, whether the paper be left in contact or not. The common practice of removing the blister at the end of five hours and substituting a water-dressing is excellent practice. If the blister be very painful and irritating to a patient, the water-dressing may be made with a half per cent. solution of carbolic acid, as in treating a superficial burn, instead of simple water, when the pain and soreness will promptly subside. This dressing, however, will lessen the counter-irritant effect of the blister somewhat, and to that extent will interfere with its object.

A collateral advantage of this fluid extract may be expected from the circumstance that the active principles are soluble in water, and may be easily washed from the surface by simple sponging after the blister is removed, thus lessening the absorption and the liability to strangury. It is also easily washed off the hands and other parts to which it becomes accidentally applied, and from the surfaces to which it is purposely applied, at any stage of its action. This should give it a great advantage over the cantharidal collodion in many of its applications, and should nicely adapt it to use about the os uteri. It should also be far more certain than the cantharidal collodion.

The writer regards this preparation as a striking example of the conservative ground which he has taken for some years past, that the search for, and the isolation of so-called active principles of drugs in therapeutics and pharmacy, may be easily, if it be not generally, carried too for. He believes that he has proved by the labor which is epitomized in this paper, that a well-constructed fluid extract of cantharides is in every practical sense better than any preparation of cantharidin, or of cantharidate of potassa, and is all-sufficient for every known use of the drug which it represents.

Therefore, as good fluid extract of ergot is far better for practical use than any of the so-called active principles of ergot; and as fluid extracts of aconite root, belladonna root, conium seed, and nux vomica, are better for therapeutic uses than aconitia, atropia, conia, and strychnia, so is a fluid extract of cantharides better than the drug itself, and better than its active principles. At least such is the conviction of this writer.

NOTE ON OFFICINAL EXTRACT OF JALAP.

The great and long-recognized difficulties of making and keeping the officinal Extract of Jalap in powder, have this summer culminated in impossibility in the writer's practice, and he has now on hand a large stock of it which is entirely unsalable, from having collapsed into a tough tenacious mass. These difficulties all belong to the watery portion of the extract, and this watery portion has long ago been proved to be inert and useless. It is not only objectionable on account of its hygrometric properties, but also because that in ordinary officinal practice, it introduces an unnecessary variability into the extract. It is well known, that no two lots of even the best commercial jalap yield the same proportion of alcoholic and of watery extracts; and that in proportion as the yield of alcoholic extract is small, from a larger proportion of immature roots, the yield of watery extract is large, and the mixture feeble in medicinal effect. Indeed it may be said, as a rule, that inferior jalap yields to strict officinal treatment, as much officinal extract as good jalap.

This difficulty was overcome many years ago by the writer, by the simple expedient of a model process. A good specimen of jalap was exhausted first by alcohol, and then by water, in strict accordance with the Pharmacopœia, but the two extracts were carefully dried separately, and weighed.

The yield of alcoholic extract from 100 pounds of powder, representing 109 pounds of jalap in the commercial condition, was 15 pounds, and the yield of watery extract was 31 pounds. These extracts when thoroughly mixed by melting them together, gave 45 pounds, the loss having doubtless been from farther drying of the watery extract.

This gives as the normal yield of officinal extract 45 per cent., if calculated upon the weight of the powdered jalap, or 41.3 per cent., if calculated upon the jalap root in its undried commercial condition. The dried extract lost about 2 per cent. in powdering.

In referring to the notes of about 2400 pounds of jalap converted into officinal extract within the past ten years, the total yield is found to vary between 35 and 52 per cent. The alcoholic extract varies between 9 and 17 per cent., and the watery extract varies between 26 and 40 per cent.

The above model process was accepted as a normal or standard, and the extracts have always been made separately, and mixed in this proportion, and in a practice of many years there has only twice been an excess of alcoholic extract, all the remaining processes, six in number, yielding an excess of watery extract.

Upon the basis of the above model process, the officinal extract consists of one-third, or 33 per cent. alcoholic extract of jalap, and two-thirds or 67 per cent. watery extract, and when so mixed must be practically uniform, though two-thirds of it may be considered inert, and worse than useless, since it is this watery extract which complicates the process and increases the labor and expense of making, while it renders the preparation difficult to keep in powder.

Under these circumstances, and because the extract of jalap if not in, at least, a coarse powder, is almost absolutely unsalable, the writer has been reluctantly obliged to abandon the officinal preparation, and now makes only the alcoholic extract as yielded by the first part of the officinal process, under the title of alcoholic extract of jalap. This extract represents good powdered jalap, in the proportion of one grain of the extract to seven grains of the powdered root; and it represents the officinal extract in the proportion of one grain of alcoholic extract to three grains of the U. S. Pharmacopœia extract. Those who choose to use it instead of the officinal extract may either take it in one-third the quantity, or may dilute each part by weight with two parts of any inert, starchy or saccharine powder, and use the well-triturated mixture in the officinal proportions. It will be hard to get a diluent which is not better adapted to the purpose than the sticky hygroscopic watery extract, but as it is rarely used except in combination with other substances, and is generally used in pills, diluents will be rarely needed.

This alcoholic extract of jalap is also much more economical than the officinal extract, because the rejection of the watery extract so much lessens the labor and expense of making as to reduce the cost by one-third, and keep the profit the same, or better. That is, supposing the officinal extract to be worth $5 per pound, the value of the alcoholic extract would be $15 per pound, whereas it can be made for $10 and pay a liberal profit.

This alcoholic or resinous extract of jalap, must not be confounded with the officinal resin of jalap, for although identical with very much of the commercial resin of jalap that is sold in the markets, it differs by nearly 3 per cent. deficiency in medicinal strength from the officinal "Resina Jalapæ." That is, when the alcoholic extract is washed with water in the proportion and in the manner directed for the preparation of Resina Jalapæ, it loses on an average about 3 per cent. The alcoholic extract is therefore so near the medicinal value of the resin, that the latter seems to be a superfluous preparation.

The writer is very much opposed to practising or advising any departure from the U. S. Pharmacopœia, and has given up making several preparations within the past ten years, because they could not be made by him without such departure. But the preparations were of less importance than this, while this process although laborious, troublesome, and unprofitable, has not until lately proved impossible. When the writer served in the Committee of Revision of the U. S. Pharmacopœia in 1850, he strenuously urged the rejection of the watery extract from this preparation for the reasons now given. But these reasons were not accepted as sufficient, although Mr. A. B. Taylor, a member of the committee then as he is now, testified to having taken this watery extract in repeated large quantities without any discoverable effect either as a purgative or diuretic. In respect and proper deference to the judgment of a majority of the committee, the writer has spent much time and labor without profit, and which labor he has always believed to be wasted throughout ten years, and only now departs from the officinal standard, because from some change in commercial jalap, or other unknown cause, it has become impossible for him to follow the process.

NOTE ON RHUBARB.

The New York market for rhubarb has been well supplied throughout the past year, and the prices very much lower than for many years. The lower grades of quality, though still largely in excess of the better kinds, have materially improved in character, while the higher grades have never been altogether absent from the market. Indeed, it has only been the choice varieties that were scarce or difficult to obtain, and often absent from the market. The demand for the better qualities has greatly increased, with much larger quantities sold at profits as good as in the lower grades; while some of the very lowest grades of damaged and worm-eaten stuff have been more rarely seen.

This very decided improvement in the market appears, however, to have an offset in the great abundance and low prices of powdered rhubarb. The smaller demand for the lower grades of all, and their partial disappearance from the market, suggests that it has not been found so profitable to bring them here as heretofore, whilst the fact of their being comparatively less salable, also suggests that they may have been converted into the more salable condition of handsome-looking powders, where damage and inferiority are hidden.

At the present time the package prices of rhubarb in the hands of real importers have a range from 40 cents up to $2 per pound, whilst powdered rhubarb of comparatively uniform appearance—that is, pretty nearly all alike in sensible properties—is offered and sold by jobbers at prices ranging from 35 cents to $1.50 per pound. The prices for powdered rhubarb are lower than for unpowdered, whilst there is no powdered rhubarb in the market that in appearance, at all represents the lower grades of the unpowdered root.

There is good reason to believe that the art of making good-looking powdered rhubarb, both at home and abroad, has been carefully studied and improved within the past few years. The clumsy and easily detected devices of turmeric, ochre, and other coloring substances, have largely if not entirely, given place to refinements and cultivation in the arts of drug powdering, and the writer believes that a use has been here found for the root of the bright-colored, non-medicinal varieties of rhubarb, cultivated in Europe and in this country. Much Austrian rhubarb, and the modern representatives of the old "Banbury rhubarb," in general, are bright and handsome in color and texture, and make a powder which is too bright until "toned down" by the damaged and discolored grades of the medicinal varieties. Some years ago, large quantities of the common garden rhubarb or pie plant, were planted and cultivated for the purpose of making wine, and for several years the annual crop of spirits from these roots were converted into rhubarb wine, before it was discovered that this wine was unstable and unprofitable. Like the speculative mulberry fever it failed and died out, but unlike that, it left the roots behind, and these, it is believed, by age and maturity, came to be a source of profit, and are reproduced as an adulterant of the medicinal varieties of rhubarb; and an adulterant admirably adapted to deception and very difficult to detect. The writer has seen samples of this mature garden or wine rhubarb, which were exceedingly handsome, and which, except for being too handsome, and of too fine a texture, would have deceived him as to its true character, yet this variety is either entirely devoid of, or very feeble in, medicinal efficacy.

Now that foreign rhubarb is free from duty, and this garden rhubarb abundant and cheap, it might be inferred that powdered rhubarb could be produced in this country so cheaply as to defy competition from abroad. Yet within the past year, large quantities of powdered rhubarb, chiefly from Great Britain, have been offered for entry at the New York Custom House, and it is a prominent object of this note to attract attention to this fact.

Whilst the writer is an earnest opponent of a general tariff, on either theory of protection or revenue, he is also an earnest advocate for the greatest possible obstruction to the overflow from foreign markets into this country of their surplus, refuse and damaged *medical* supplies. The arguments for *unobstructed* as well as *free* trade, do not apply with equal generalization, nor with equal force to medicinal merchandise and trade as they do to general trade, and hence the very great value of even the present imperfect and inadequate drug law, to the best interests of the drug market, in the judgment of the writer ; and this influx of powdered rhubarb whose quality cannot be determined in any easy way, is an excellent illustration of the effect of such obstruction by law. Early in the year the special examiner of drugs for this port of entry, took the ground that the fitness of powdered rhubarb to be admitted to entry under the drug law, could not be determined by the means which the law placed at his disposal, and he very properly resorted to expert testimony from outside of his office, to aid him at arriving at proper and just decisions. The writer was among those who were consulted by him, and samples from many invoices offered for entry have been examined by the writer within the year, and not a single one has been found that was considered fit for medical use. From the very first the writer has earnestly urged the special examiner to reject all powdered rhubarb; and all other powdered drugs whose quality cannot be easily determined by some simple and easy process of assay. And farther, to throw the onus and expense of all such processes of assay upon the importer of the powdered drug.

The importation of any drug in powder is *prima facie* evidence that there is something to be concealed by the condition of being in powder, and this evidence should be taken as overbalancing all other evidence in the case of medicinal substances, until it can be annulled by proof to the contrary. Such proof, in the case of rhubarb, and many other drugs, is so nearly impossible as to be quite impracticable, and therefore the only line of safety for such articles is total exclusion.

The testing of powdered rhubarb presents so many difficulties, and is such a difficult and tedious matter, and the results are so far from being accurate demonstrations, that, as above stated, the testing is impracticable for the pharmacist. To establish the absence of turmeric, ochre, &c., and to see nothing by the microscope, are either separately or together of but little value. Of still less value is the proportion of extract given to water and to alcohol. But the proportion of oxalate of lime, the examination of the exhausted residue, the amount of color, odor, and taste, given by one part to one thousand parts of alcohol, in comparison with a similar treatment of a well-known standard, are when taken together, more trustworthy. Yet after the application of all the tests that have as yet been proposed there must still remain a degree of uncertainity which can only be cleared up by the application of the drug in use. Then if it fails it is of course too late to correct the defects.

The drift of all this should lead to the conclusion, that it is never safe for the pharmacist to buy powdered rhubarb; and to this may be added the fact that rhubarb is not difficult to powder, is not necessary to have in very fine powder, and is not wanted very often, nor in very large quantities, by any dispensing pharmacist.

NOTE ON PAREIRA.

PAREIRA BRAVA is a drug which has withstood the mutations of therapeutics and commerce for nearly two hundred years, and it is a singular and significant fact, in view of its commercial history, that it has sustained a sound reputation with many critical observers.

It appears to have been introduced to European practice from Portugal, but its sources were Mexico, tropical South America, and the West Indies. Under a name so indefinite as "wild vine," or "bastard vine,"—the translation of the name Pareira Brava,—it is hardly possible that the markets should have always been supplied from the same plant, even after its botanical source was determined, and hence the varying descriptions of different authorities may be accounted for. The writer has been familiar with it, both in its use and in its market character, for more than twenty-five years, and for the last half of this period supposed he knew the substance with some degree of accuracy, as its appearance was more uniform than that of most drugs. It, however, never had more than a very general agreement with any of the descriptions given of it; and the almost universal testimony of those physicians who knew it best was, that although very efficient in the treatment of chronic diseases of the mucous membranes of the urinary passages, it was only useful when given in doses very much larger than those prescribed by the books.

It has so happened, that in the New York market the trade in this drug has been largely, though not exclusively, confined to one drug house, and its appearance, as met with here, is identical with occasional samples seen from other cities. Some ten years ago, the annual sales here did not exceed three or four hundred pounds, and the price was fifteen to twenty cents. A Portuguese merchant, stimulated by this high price, imported a lot of some ten thousand pounds, and unable to sell it except in small lots at the expected prices, stored it for a year or two. This was found to be expensive management of so bulky an article, and the lot was finally sold at eight cents, and supplied the market for years. Another lot of about half as much shared the same fate, and fell into the same hands. The fate of these two lots and the glut of the market, seems to have stopped importation entirely, and by 1871, when the annual sales had reached three to four thousand pounds, the supply became exhausted. In resorting to foreign markets it was found scarce, and to be had only in small lots, and these, on arriving here, were held at seventy-five cents to a dollar a pound. In looking critically through one of these small lots as a purchaser, the writer was surprised to find nearly one-half of it so entirely different from any hitherto seen, that he rejected it, and at once pronounced it a fraudulent adulteration or substitution, made in the interest of the scarcity and high price, and carefully selected out for purchase that only which he had seen before. Some specimens of this supposed fraudulent Pareira were, however, taken for examination, and were found to agree well with some of the older descriptions. A plate given by Pomet in his History of Drugs, published in 1737, and a close examination of the structure, &c., convinced the writer that this was the true Pareira root, and that what he had heretofore seen was the stem.

In a critical review of the descriptions of Wood and Bache, and Pereira, these descriptions were found to apply to both, as nearly as such descriptions generally do to foreign drugs, but that they applied much better to the ligneous woody stem, which is comparatively insipid and inert. The root is very much darker, almost black externally, and both the annular and vertical wrinkles are very much larger and more prominent. It occurs in shorter sections than the stem, and gnarled pieces are found eight inches to a foot in diameter. The texture is far less compact than that of the stem, while the beautiful arrangement of the consecutive rings seen in a cross section, which requires a glass in the compact stem, is well seen with the naked eye in the root. The sweetish and afterward bitter taste of the woody stem is very feeble, and even when in the finest powder, it yields very little extract to any menstruum. The taste of the root is, however, very much stronger, and yields at least twice as much extractive matter to the menstrua. The specimens herewith presented illustrate the difference between the root and stem much better than any description, and will render further explanation unnecessary.

It thus appears that, for some twelve or fifteen years past, this market has been supplied with the comparatively inert stem, instead of the root of Pareira; and that the ideas of at least one careful purchaser had become so fixed upon the intractable woody stems, that when the roots did appear, they were very nearly rejected as a fraudulent substitution. The importations of this year thus far have come from the European markets in small lots, and have been a mixture of root and stem, but less of the root than stem, and the chief object of this note is to attract attention to the drug, and create such a demand for the proper root portion, that after the present scarcity is over, and the market comes to be again supplied direct, the stem may be rejected.

There is no doubt whatever as to the peculiar efficacy and utility of this drug within its legitimate sphere in therapeutics, and the wonder is that it has been able to sustain its well-tried and time-honored reputation upon the feeble medicinal properties of the stem.

NOTE ON LITMUS PAPER.

The rapid progress of medical science, and the consequent improvement in the art of medicine, renders the modern physician much more critical and accurate in his investigation and observation of diseased conditions; and for the means by which to attain greater accuracy and precision in his observations and researches he properly and naturally looks to the pharmacist.

In this way, within the past few years, litmus paper has become an important, if not indispensable agent to the intelligent physician, and he often seeks it, but rarely finds it in the hands of the pharmacist. And when found, it is rarely of the quality or in the condition best adapted to his uses. When the physician and pharmacist buy litmus paper, they generally make the same mistake that the photographer does, and demand that it shall be deep in color; that the blue shall be very blue, and the red very red. This is wrong in principle and in practice, particularly for physicians' uses, where slight traces of alkalinity or acidity are often important, and the palest instead of the deepest paper should always be selected. The solution made from one pound of good litmus commonly requires about two hundred grains of concentrated sulphuric acid to saturate it up to the point at which the color *begins* to change to purple in its course toward redness, and this purplish tinge of pale blue, and the corresponding purplish tinge of pale red are the desirable colors, between which is the least margin of difference which is left undetected by the testing.

This large proportionate quantity of sulphuric acid indicates how comparatively roughly the carelessly made and deeply colored litmus papers fulfil their design; and it is the object of this note to indicate a better practice, and a better state of knowledge on this subject. To prepare good litmus paper, the following formula may be useful:

Take of—

Good Litmus, in fine powder,	1 part.
Water,	4 parts.
Alcohol,	1 part, all by weight.

Put these ingredients into a bottle, and shake the mixture occasionally during twenty-four hours; allow the sediment to settle out completely, and decant as much as possible of the clear liquid into another vessel; then put the same quantity of water and alcohol upon the sediment, shake again, and when again well settled, pour off the clear liquid for use in diluting the first portion of liquid, or for dissolving a fresh portion of litmus. Separate about one-fourth part of the first clear liquid, and add to the remainder dilute sulphuric acid until it becomes of a purple tint, or gives a purplish-blue color to a slip of white paper; then add about one-half of the separated fourth part of the solution, and if this should entirely restore the original pure blue color, again add diluted acid until a purplish tint is again obtained; then add the remaining eighth part of the original solution to restore the pure blue color, or which is more delicate as a test for acidity, a very faintly purple-blue color; then dilute this solution either with water, or with the second liquid from the litmus sediment until a slip of neutral white paper dipped into it has a pale blue, or pale purplish-blue color. Here it is necessary to remember that this paper when dry, is many shades paler than when wet, and the dilution should be made accordingly. The solution for making red litmus paper will not bear the same amount of dilution as that for the blue, and must be made of the proper purplish-red color by the addition of dilute acid, before dilution. The solutions so made will keep almost indefinitely, and may be passed on from one process to the next. The paper should be made from pure rag stock—not from bleached wood nor straw—should be quite white, and above all, must be quite neutral, and show no red spots or blotches when moistened with the blue solution. French or German filtering-paper commonly answers well if of good quality. This is cut into convenient size, the larger the better, because there is less waste, and held by two corners, which corners are to be kept dry; it is to be skilfully laid on the surface of the solution, first one side and then the other, then drained, and hung over clean glass tubes to dry. The vessel to hold the solution for dipping should be larger than the sheet of paper, and shallow.

The sheets when dry are laid together, and the edges trimmed off all round. They are then cut into sheets three to four inches wide and twelve to eighteen inches long, according to the size of the paper used. What is sold as "a sheet of litmus paper," should never be less than four inches by twelve, or three by eighteen. Such a sheet cut lengthwise through the middle, gives a strip which when cut crosswise into strips a quarter or three-eighths of an inch wide, is of a very convenient size and form for use. The sheets, one paler and one deeper of the same color, if desired, should be rolled up together in a tight roll, slipped into a test-tube and corked. An ordinary five-inch test-tube holds the sheets conveniently, and one such tube of the red and one of the blue, properly labelled, forms a convenient pair, such as is supplied to the U. S. army, by the writer. Formerly these sheets were enveloped in tin foil, but though they thus keep much better than in paper, they are when pale and delicate very liable to be changed and spoiled by the alkaline and acid vapors in the air. In corked test-tubes they keep unchanged for an indefinite time, while the test-tubes and corks when empty are always worth their cost to those who use litmus paper.

In this form of sheets, however, the paper is not so convenient for the physician as when cut into strips one to two inches long and a quarter of an inch wide, and the writer finds that about one hundred of such strips, put up in a wide-mouth tube vial, corked and properly labelled, is a most convenient and popular form for physicians' use. One such vial of each color put up together forms a pair which no physician should be without. And most physicians will buy them if they can get them. These convenient little strips may be shaken out of the vial as wanted for use, but as the fingers should, by rights, never touch any other strip than the one taken, it is best to take them from the vial by a pair of forceps from the physician's pocket-case.

NOTE ON THE COMMERCIAL BICARBONATE OF SODA.

The writer having recently had occasion to supply some bicarbonate of soda to the medical department of the U. S. army, examined the popular brands found in the New York market, with the results given in the following table.

The French bicarbonate is not associated with the name of any particular maker, but is simply known as "French Bicarbonate of Soda." It appears to be imported in cases of one to three hundred pounds each, but is at once transferred into boxes of twenty-five and fifty pounds each.

The English is generally imported in kegs of one hundred and twelve pounds each, and the products of four different makers are met with in the market; those of Chance Brothers, of Birmingham, and C. Allhusen & Sons, of Newcastle-on-Tyne, being perhaps the most common.

The American varieties are from well known makers of good standing, who produce large quantities, and perhaps fairly represent the manufacture in the United States. Their products are found in kegs and boxes, and very often put up in printed wrappers containing a pound, a half pound, or a quarter of a pound each, with directions and formulas for use in cooking.

The largest proportion by far of all these varieties is used in cookery and in the arts, and but a very small proportion in medicine and pharmacy. But as hygiene is a most important part of applied medical science, pharmacy becomes responsible for the character of the bicarbonate of soda which is used in the preparation of food, as well as for that used therapeutically.

It is made in enormous quantities, and always in connection with other salts of soda, from the chloride of sodium and the carbonate and sulphate of soda. The average annual import of this article is about 21,000,000 pounds, or more than half a pound for each inhabitant of the United States, and the average cost in gold is about 3 cents per pound. Upon this import a duty of 1½ cents gold per pound is charged. Thus in the aggregate each inhabitant of the United States is annually taxed three-quarters of a cent in gold, to support and protect the pecuniary interests of not more than five or six manufacturers of this article in the United States.

Various sources of carbonic acid are made available for converting carbonate of soda into the bicarbonate, and the odor of the brewer's fermenting vat, which was one of the old sources, is still occasionally recognized in some chance samples of the salt.

When properly made it consists of:

Oxide of Sodium, NaO, . .	31.2	parts, or	37.05	per cent.
Carbonic Acid, $2CO_2$, . .	44.0	“	52.20	“
Water, HO, ...	9.0	“	10.69	“
	84.2	“	100.00	“

Both the United States and British Pharmacopœias direct that the officinal preparation shall have this composition, and both give formulas for its preparation, and tests which reject all other combinations of its elements. With the present value of labor and struggle for life, it is quite unreasonable for the Pharmacopœias to expect any pharmacist to make so cheap an article, and, therefore, the officinal formulas and processes are useless. The descriptions and tests given are also comparatively useless, because they are hypercritical, and in a large proportion of instances would even exclude the products of their own formulas and processes. It is very difficult and wasteful, particularly in operating on a large scale, to entirely saturate the carbonate of soda with carbonic acid, and the attempt was practically abandoned long ago as the article came to be needed in such large quantities. A maximum economical limit was soon attained, accepted as sufficient, and became established; and upon this rather than upon theoretical perfection, the description and tests of the Pharmacopœias should be based. Competition in market price, with careful protection of profits, has, however, a constant tendency to run down quality, and against this the Pharmacopœias should exert all their influences.

In addition to other information given in the following table, it will be seen that all the varieties are deficient in carbonic acid. That is to say, not one of them is really bicarbonate of soda. The best brands are deficient in carbonic acid by about one-eleventh part of what they should contain, or about 9 per cent. of the normal quantity, whilst the other brands are much lower. And although it may be impracticable to get a full bicarbonate by the large manufacturing processes, yet all of them should come nearer to it than they now do, and will come nearer to it if a critical demand at better prices should arise.

All the tests necessary to a critical discrimination are indicated in the table, and all are simple and easy of application. But those of greatest practical value are the easiest and most simple. The solubility in cold water with the color and transparency of the solution, and the loss by heating a weighed portion, are quite sufficient as tests in the present condition of the market. In heating a weighed portion, it is not necessary

Commercial Varieties of Bicarbonate of Soda from the New York market, 1871.

Make or Brand.	10 Grammes dried over SO_3 for 75 hours, loses	Solubility of one part in water at 25° C. = 77°.	Solution.	Loss on heating one gramme should be 0.368, or 36.8 per cent. The actual loss is	Color of Bunsen flame in which the sample was heated.	84.2 parts should yield on saturation 44 parts CO_2. The actual yield is	Chlorides in the sample.	Sulphates in the sample.	Currency price in quantity per lb.
French, ...	0.008	10 parts.	Colorless. Transparent. Very slight residue.	0.355, or 35.5 p. c.	Slight yellow tinge.	40.3	Faint trace.	Faint trace.	12c.
French, ...	0.007	10 parts.	Nearly colorless. Transparent. Very slight residue.	0.349, or 34.9 p. c.	Slight yellow tinge.	39.4	Faint trace.	Faint trace.	10c.
English, Chance's, .	0.006	10 parts.	Nearly colorless. Transparent. Slight residue.	0.354, or 35.4 p. c.	Yellow tinge.	40.2	Faint trace.	Faint trace.	8c.
English, Allhusen's,	0.007	10 parts.	Nearly colorless. Transparent. Slight residue.	0.353, or 35.3 p. c.	Yellow tinge.	40.3	Faint trace.	Strong trace.	5½c.
American, Kidder's,	0 008	10 parts.	Nearly colorless. Transparent. Slight residue.	0.347, or 34.7 p. c.	Yellow tinge.	38.7	Strong trace.	None.	10c.
American, Dwight's,	0.046	10 parts.	Colorless. Milky. Considerable residue.	0.338, or 33.8 p. c.	Yellow flame. Salt fuses.	38.5	Dense precipitate.	Dense precipitate.	5c.
American, Church's,	0.050	10 parts.	Nearly colorless. Milky. Considerable residue.	0.339, or 33.9 p. c.	Yellow flame, Salt fuses.	38.5	Dense precipitate.	Dense precipitate.	5c.

to heat it to redness as directed by the books, nor is it necessary to heat it long. And an ordinary porcelain capsule of small size, with a common alcohol lamp, are all that is necessary. If the heating be done in a Bunsen gas-burner flame, the greater or less yellowness of the flame will roughly, though practically, indicate the proportion of chloride of sodium, for, the British Pharmacopœia to the contrary notwithstanding, bicarbonate of soda free from chlorides does not give a yellow color to flame, in a practical sense, the best brands in the market hardly tinging the flame at all.

The critical assay of the proportion of carbonic acid is conveniently made by a careful use of Fresenius and Wills's twin bottles. At least these were used with facility in making the above table.

NOTE ON CHLORAL.

Chloral supplies another forcible illustration of the baneful effects of speculation and inflation, and of the dangers which must always attend popularity; and, particularly the popularity of potent medicinal agents. It seems hard to teach the public that nothing can be potent only for good. That to be potent for good involves, in the very nature of all things, an equal potency for harm. Hence the danger of advertising any medical substances which have any potency, for popular use. The multitude of mere placebos, and catch-penny quackeries, which serve at the same time to make money, and give mental occupation and relief to trifling or imaginary ills, may be puffed and inflated for popular use with comparative safety. But when this same process is applied to a potent agent like chloral, the chances are always greatly in favor of the substance doing more harm than good, until a panic and a prejudice are produced against it, when it may be unjustly condemned and lost.

The definite results from the careful and proper use of chloral, and its great importance in filling a place in therapeutics hitherto vacant, fortunately secure it against being lost by this reaction; and it is perhaps well, therefore, that by the sacrifice of a few lives at the outset of its career, many lives may be saved, and its use be restricted to the hands of physicians. Pharmacists cannot be too careful how they advise or dispense such agents for popular use, and they will undoubtedly be, sooner or later, held responsible for all the misuse to which their commodities may be applied.

The experience and education obtained in the making of some fifteen hundred pounds of chloral within the past year, have served to improve the writer's knowledge of this important substance, and may justify him in offering some remarks upon its characteristics and tests.

Since it has become easier to make the hydrate than the alcoholate of chloral, the latter and all mixtures of it have practically disappeared from the market without any probability of their ever reappearing. This renders the tests for alcohol and alcoholates unnecessary.

When the water of hydration is in excess, or when solid compounds of hydrate of chloral and water are put up, the substance is deliquescent, or even melts in warm weather, and a very slight excess of water manifests itself very soon by some degree of deliquescence. Whether in cake or crystal it is now very generally put up slightly deficient in water of hydration; that is, the chloral is not fully saturated to the condition of a full hydrate, and under proper control this is the best practice yet arrived at by the writer. If it could be exactly saturated, that of course would be best, but as this seems not easily practicable, it is best to have the water a little short of full hydration. If more than a shade short, however, the hydrate is proportionally pungent, because anhydrous chloral is much more pungent than the hydrate. Another disadvantage of the presence of free or anhydrous chloral is that it renders the hydrate which contains it more liable to become slightly acid. These circumstances, and the fact that under varying conditions, chloroform dissolves more or less water, and watery solutions dissolve more or less chloroform, together render the chloroform test fallacious and comparatively useless as ordinarily applied. That is, the yield of chloroform may be always the same if the decomposition be complete, but it cannot be weighed or measured with sufficient accuracy.

Chloral has now been made in such quantities, and with so much competition, and it is so comparatively easy to make it of fair quality, that the mistakes and imperfections arising from ignorance are now no longer made, and the general quality has got far beyond the reach of the earlier tests. More sensitive and more delicate tests are now needed—not to decide whether a given substance is hydrate of chloral, but to decide between different specimens of hydrate of chloral which come into the markets, even from the same manufacturer—as to which contains the least or the most of other and mere accidental products of the action of chlorine on alcohol. In all the better brands these accidental products are in very small proportion, and not easy of detection. Just as in the instance of chloroform they are neither made, nor left in it purposely or carelessly, and the defect lies simply in the insufficiency of the means and the labor necessary to take the last portions out. Within practical limits they may all be taken out by any of the processes in use for the purpose, provided these be used with sufficient skill, pains, and labor; and the want of uniformity of the best brands now in the market, is chiefly due to want of care and labor. That is, profit being the chief object, this is increased by dodging its greatest enemy, namely, skilful labor.

After a large number of examinations, the writer comes to the conclusion that at present there is no single test which will indicate the quality of chloral, and that the value of any group of tests depends almost entirely upon the skill and care with which they are applied. The sensible properties are very characteristic to those who are expert and familiar with the substance, and by a little education and practice any one may soon attain a pretty critical judgment.

The writer still greatly prefers the granular crystalline form to any other, as conducive to greater purity, and the most simple and critical mode of examination known to the writer, and which has not been hitherto published, is by means of chloroform. Chloral and its hydrate are both freely soluble in chloroform, and from this solution, when dropped on bibulous paper, or evaporated from a watch-glass, the chloroform flies off first, the anhydrous chloral next, and the hydrate last and more slowly. The impurities are still less volatile, and may be detected in the later stages of the evaporation by their different odor. The hydrate of chloral, after the last traces of anhydrous chloral have passed off, is comparatively inodorous, and what odor it has is very mild, sweet, and clean, so that any contamination of this mildness and sweetness is the more easily recognized. The chloroform used must of course be itself free from much impurity, and should not color sulphuric acid. The solution of chloral in chloroform, when tested with sulphuric acid, just as chloroform is tested, should give no color to the acid. The acid should be poured slowly into the chloroform solution, when the slightest change of color can be seen at the line of separation between the two liquids before they are shaken together. Indeed, after shaking, the colored stratum becomes so diluted by the excess of acid, that the tint may be hardly recognizable. So delicate is this test that when carefully and properly managed, no specimen of chloral has ever been seen, except when taken directly from the purifying flasks, that would not give *some* color at the line of separation between the liquids. That is, the atmospheric dust which is unavoidable in the handling and putting up of the chloral, is sufficient to give a tinge at the line of separation. As in the case of chloroform alone, the color, however much or little increases by standing, and is only fully developed after twenty-four hours. In this testing the chloroform alone should be tested, side by side with the chloroformic solution of chloral, and only the difference be taken into account. Of course, colorless concentrated sulphuric acid should be used, and a chemically clean glass-stoppered bottle, as in the testing of chloroform.

The next important step in the examination, not hitherto published, is the freezing-point, or the temperature at which the chloral begins to crystallize when melted. This point appears to be very definite, and is very easily ascertained. An ounce bottle of chloral, as purchased, should have the glass stopper loosened but not removed (it should never be sold in any other than glass-stoppered bottles), and the bottle should be then immersed to the shoulder, in warm, not hot, water, and occasionally shaken until the chloral is melted. The liquid chloral should of course be colorless, transparent, and free from specks of foreign matter to a practical degree. The bottle should then be taken from the warm bath, the stopper removed, and while held by the neck, the bulb of a small chemical thermometer should be placed in the liquid and used continuously as a stirrer until the liquid becomes opalescent, or loses its bright transparency. At this moment the temperature should be taken and noted. The bottle is then again placed in the warm water, and the contents stirred until again transparent; then again removed from the bath and again stirred to the crystallizing-point, and the temperature again noted for verification of the first trial. This does not waste nor injure the chloral at all, and the thermometer when removed should be immersed in distilled water in a small test-tube, to dissolve off the adherent chloral. The solution thus obtained if tested with pale blue litmus-paper, will commonly indicate slight acidity, and with solution of nitrate of silver will give slightly more cloudiness than the water alone will give. The writer has never tested a specimen of chloral which had been six months made, which did not give evidence of slight hydrochloric acid acidity, if the testing was delicate. Hence it is not amiss, though perhaps not important, to add a drop or two of ammonia to all solutions of chloral when dispensed for use, as originally advised by Liebreich, since it may serve to arrest a commencing decomposition which might soon become rapid in the solution, particularly when the solution is to be kept many days, or when it has organic matter of any kind in it.

To return to the freezing-point. Specimens of chloral from the best makers may be found in the market, which begin to crystallize at from 45° C. = 113° F., up to 52° C. = 125.6° F. The best specimens, however, crystallize between 48° C. = 118.4° F., and 51° C. = 123.8° F. Those which crystallize at the higher temperatures contain the most anhydrous chloral, and those which crystallize at the lower temperatures contain an excess of water. Accurately hydrated chloral crystallizes at about 48° to 49° C. = 118.4° to 120.2° F., and the best practically adjusted specimens crystallize within one-half a degree of 50° C. = 122° F. Specimens which crystallize below 48° C.

=118.4° F. do not stand summer temperatures without becoming moist, whilst those which crystallize below 47° C. = 116.6° F., are proportionately deliquescent. This tendency to deliquesce is, however, mainly due to the interstitial mother liquid, and this liquid it is which absorbs the moisture of the atmosphere, and thus finally dissolves the crystals in warm weather. Hence as large crystals can only be obtained by comparative slow crystallization from more dilute solutions, they contain the most watery liquid in the interstices, and therefore, soonest deliquesce. A basin of large crystals, looking somewhat like bromide of potassium, in regard to the size of crystal, stood upon the writer's table covered loosely with paper, from March until September. Up to the 1st of June they remained quite dry, and could be powdered as easily as bromide of potassium. They then began to grow moist, slowly at first, but very rapidly during the latter part of July, and now in September there is a confused mass of crystals at the bottom of the capsule, covered by an inch or more of transparent syrupy liquid.

A few pounds of these same crystals standing in the same place, in an imperfectly stoppered, wide-mouth bottle, and this frequently opened, have kept much better, and are in fair condition, though moist. Small granular crystals which form from the melted chloral when carefully underhydrated, seem to be by far the best form for convenient practical use.

All the writer's experiments, and they have been numerous, of crystallizing from bisulphide of carbon, from ether, from chloroform, and from oil of turpentine, have failed in practicability.

Another important test of quality for commercial chloral is its boiling-point. This was early recognized as a test, because no two liquids are known which boil at precisely the same temperature, while all mixtures are known to have a moving boiling-point, that is, do not boil continuously at any fixed temperature. Writers, however, have given a very different value and significance to this test, some regarding it as no test at all, while others have considered it infallible. This discrepancy appears to depend upon the skill or want of skill and knowledge with which the test was applied. Most liquids can be heated far above their boiling-point without boiling, but all can be made to boil at the normal boiling-point by proper management. Chloral simply heated in a clean test-tube, may or may not boil at its boiling-point. But if the test-tube be one-sixteenth filled with broken glass, and be heated in a glycerin bath, the chloral will boil at its normal boiling-point, and will continue to do so, and a chemical thermometer immersed in it, will indicate the boiling-point with accuracy.

Accurately hydrated chloral begins to give off bubbles of vapor from the hottest surfaces of the tube when the thermometer indicates about 90° C. = 194° F., but it does not properly boil throughout the liquid below 97° C. = 206.6° F., and one-half of it at least will boil off before the temperature varies much from this point. It however appears to gradually decompose from air contact, or some other cause, underhydrated chloral boiling off, and overhydrated chloral remaining, so that the boiling-point gradually rises, after boiling for some time. The best commercial specimens of chloral—that is, a little underhydrated—begin to boil throughout the liquid at about 96.5° C. = 205.7° F. The underhydrated portion, however, boils off in a few seconds, and the thermometer rises to 97° C. = 206.6° F., and finally to 97.5° or 98° C. = 207.5° or 208.4° F., by the time that half the liquid has boiled off.

Chloral should not begin to boil fairly below 95° C. = 203° F., because if it does it is too much underhydrated, and therefore too liable to decomposition; and it should boil down to one-half steadily at 97° to 98° C. = 206.6° to 208.4° F. If it boils off above 98° C. = 208.4° F., the indication is that it is overhydrated and deliquescent.

The natural accidental impurities which are left in the chloral are, in all the better grades, in so small a proportion as to escape detection by any ordinary application of the boiling-point test.

In conclusion, it may be remarked that while several of the grades of chloral now to be found in the market are worthy of confidence, they are by no means uniform, but are improving in this respect; and there is no reason to fear that good chloral will ever again be inaccessible at a moderate price. The enormous scale upon which it has been made in Germany, and the difficulty of reducing this scale to meet the reaction which fatal cases of poisoning in popular use has caused, have overstocked and very much depressed the market; and it is to be feared that some of this overstock may become decomposed before it can be consumed. The quality should therefore be closely watched, and as soon as a parcel is found to be strongly acid it should be rejected. The test of acidity by means of a glass rod wet with solution of ammonia held near the mouth of the bottle, though useful, is not entirely trustworthy, and is hypercritical, since the vapor of anhydrous chloral, whether of itself or by slight decomposition from air contact, produces a cloud with ammonia.

SUPPLEMENT TO THE PHARMACIST,

SEPTEMBER, 1873.

MEMORIAL.

Justus von Liebig died in Munich, April 18th, 1873.

Few names of cotemporaries have extended as far as his own over the habitable globe, and been mentioned equally with grateful reverence everywhere, at home and abroad, in city and country, by rich and poor, savans and laymen. His faithful labor extended to all branches of inquiry, far beyond the limits of that science to which his life was devoted, opening new ways and means to knowledge, new fields for investigation. While his creative mind endeavored indefatigably to penetrate the secrets of nature, to determine in the changes of phenomena the eternal law, it was to his warm heart the most joyful satisfaction to make the results of science productive to mankind, and to carry to the furthermost circles the benefits of culture. Coming generations will yet bless the name of him who gave to them the power to maintain and increase the fruitfulness of the soil, and thereby rescued them from the danger of desolation of their habitations.

Thus Justus von Liebig erected himself the most enduring monument to his name. His cotemporaries feel, nevertheless, the necessity to immortalize the memory of the great philosopher, the generous and amiable man, by a visible representation. In Munich, the city which had become his home, and was witness for 21 years to his faithful labors, they intend to erect a fitting monument to his memory.

To the realization of this idea, friends and admirers of the departed in Munich soon formed a committee. The members of the Board of the German Chemical Society in Berlin have been active in the same direction, and following their summons, a large number of men in all conditions, and of different nationalities, soon united for the same purpose.

Out of the union of the Munich and Berlin committees, the International General Committee was created.

The International General Committee for the erection of a Liebig monument in Munich calls upon all admirers of the great scientist to take part in this work of gratitude. May the numerous students and friends of Liebig, may all who enjoyed his writings, or drew benefit from his works, make the task, to which the committee devotes itself, also their own ; and may all, each in his sphere, work according to their means for a general participation, in order to achieve a worthy solution of this undertaking.

Inquiries, concerning the erection of the Liebig monument are to be directed to the office of the International General Committee, No. 10, Dorotheen street, Berlin.

Contributions will be received by Mr. Thos. N. Jamieson, Treasurer of the Chicago College of Pharmacy, or by the Editor of this journal, who will give a public account of contributions received, and forward the same to the International General Committee of the Liebig Monument Association, Berlin.

TABLE OF

OR ALKALOIDS, Etc., ACC

By STA

orbed by Ether from Acid Solution.*			ABSORBED BY ETH			
WITH TANNIN.			SOLID (WI			
PRECIPITABLE.		NOT PRECIPITABLE	WITH CONC. SULPHURIC ACID.			
			IN THE COLD.		ON WARMING.	
			ROSE-RED.	BROWNISH RED.	First yellow, then orange and cherry-red.	First ye then blu violet a dark re
hicina.	**Digitalin.**	**Picrotoxin.**	**Brucia.**	**Delphinia.**	**Veratria.**	**Narco**
tion, *yel-* HNO^3 s it *vio-* the ni- acid so- n is di- ed and e alka- e with)H, an *nge-red* ation is uced.	Mixed with solution of ox-gall and conc. H^2SO^4 a fine *red* zone is produced at first, afterwards a *red* liquid. — Dissolved in conc. H^2SO^4 and a trace of bromine-water added, a violet-red coloration appears.	The colorless solution in water holding soda reduced by Fehling's copper-solution.	Dissolves in conc. HNO^3 with a *light red* color, which on warming changes to *yellow;* if then chloride of tin is added, a *blue-violet* color appears.	With conc. H^2SO^4 and bromine water *violet-red.* The same coloration appears on evaporating with phosphoric acid. *Aconitia* dissolves with a *brown-red* color in H^2SO^4	Dissolves in conc. HCl. colorless, but on warming becomes fine *dark-red.*	The soluti in H^2SO^4 a on additi of a trace HNO^3 is re conc. H^2S which co tains a tra of molybda of sodiu is colore *green.* Dissolves i chlorine-water gree ish white but on ad ing NH *yellow-re*

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* Small quantity of Atropia.

REACTIONS,

ORDING TO THE PROCES

S-OTTO.

ER FROM ALKALINE SOLUTION.**						REMAINING ALKALINE SOI
IOUT ODOR).				LIQUID. (STRONG ODOR.)		**Morphi**
	With conc. sulphuric acid and bichromate of potassium.		With conc. phosphoric acid on warming.	WITH CHLORINE WATER.		The solut made alka with NH^3 duces, on w ing with an nio-oxide copper, a *g* *green* solut (Nadler Conc. HN colors it *bloo* neutral Fe *dark-blue.* dissolved in H^2 SO^4, wa allowed to and some F added, an in *red* color app Reduces fr solution of acid, iodi which dissol bisulphide o bon with a color.
	IN THE COLD.	ON WARMING	**Aconitia**	Precipitable.	Not Precipitable.	
low, ue- nd ed.	BLUE-VIOLET	ODOR OF FLOWERS.	Produces a *violet* coloration. Is dissolved by conc. H^2SO^4, with a *fawn-brown* color — Delphinia and digitalin produce the same reaction with H^3PO^4	**Conia.**	**Nicotina.**	
na.	**Strychnia.**	**Atropia.**		Aqueous solution becomes col'd on warming. — Dry muriatic acid gas colors it first *red*, then *deep blue.*	Aqueous solution, not colored on warming. — Becomes violet on gently warming with HCl, if HNO^3 is added, then the color changes to *orange.*	
tion and ition e of *red;* $^2SO^4$ on- race date um, red s in e- een- ite, add- H^3 *red.*	Solution in HNO^3 *yellow* the *blue-violet* color appears also, when instead of the $K^2Cr^2O^7$ MnO^2, PbO^2, red prussiate of potassium or iodate of potassium is taken. —— NOTE: *Curarina* produces a reaction similar to strychnia; it becomes, however, red on adding H^2SO^4 and is also not absorbed by ether from an acid or alkaline solution.	The fragrant odor appears more certain and distinct when a few crystals of chromic acid are placed upon the alkaloid, and very gently warmed until green oxide of chromium begins to form.				

** Also partially Colchicina and Digitalin.

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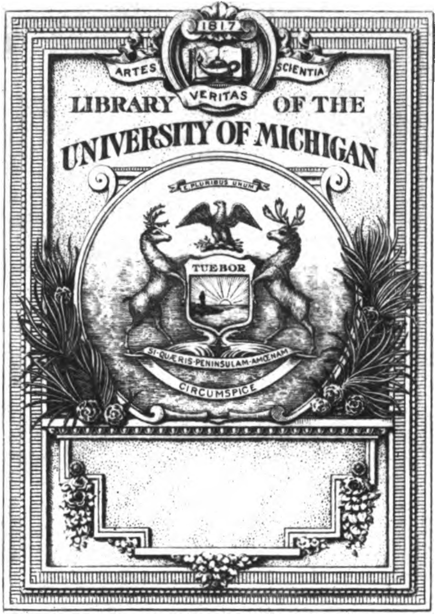

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